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Asks Bids on 79,630,000 Pounds of Paper

Joint Congressional Committee On Printing Will Open Proposals On September 20 To Obtain Supplies For the Government Printing Office For the Three Months' Period Beginning October 1, 1943.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 1, 1943—Bids will be received on September 20 by the Joint Congressional Committee on Printing for 79,630,000 pounds of paper for the use of the Government Printing Office for a three months' period beginning October 1. The present contract was also for a three months' period for which bids were received for 78,450,000 pounds. The Congressional Committee will meet on September 27 to consider awards. The commitee is asking for bids on the following paper:

2,500,000 pounds newsprint paper.
200,000 pounds telephonebook news.
3,860,000 pounds machine-finish book paper.
100,000 pounds antique book paper.
4,020,000 pounds offset book paper.
90,000 pounds lightweight machine-finish book paper.
150,000 pounds 50% antique book paper.
15,000 pounds 75% laid antique book paper.
3,800,000 pounds supercalendered book paper.
1,300,000 pounds machine-coated book paper.
500,000 pounds coated book paper.
40,000 pounds lithograph paper.
3,000,000 pounds mimeograph paper.
300,000 pounds U S M O safety writing paper.
4,000 pounds U S M O writing paper.
23,400,000 pounds writing paper.
4,840,000 pounds map paper.
2,740,000 pounds manifold paper.
12,114,000 pounds bond paper.
2,527,000 pounds ledger paper.
3,620,000 pounds index paper.
640,000 pounds cover paper.
500,000 pounds manila paper.
500,000 pounds kraft paper.
1,000,000 sheets gummed paper.
120,000 pounds blotting paper.
30,000 pounds high-finish red sulphite.
100,000 pounds manila tag board.
1,100,000 pounds calendered tag board.
150,000 pounds jute tag board.
100,000 pounds manila cardboard.
310,000 sheets railroad board.
650,000 pounds bristol board.
4,500,000 pounds postal card bristol.
60,000 sheets pressboard.
1,200,000 pounds news board.
920,000 pounds binder's board.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

Specifications Committee Reports

The Paper Specifications Committee of which Ansel Wold is chairman made the following report to the Joint Committee on this opening:

The Committee on Paper Specifications respectfully submits its Forty-seventh Report and the accompanying recommended schedule for paper for the public printing and binding and blank paper for the use of the Government departments and establishments in the District of Columbia for the term of 3 months beginning October 1, 1943.

Two new items of Chemical Wood White Ledger have been added to cover the demand for 48 pound ledger. This schedule embraces 138 lots, which is one less than the preceding schedule. The quantity estimated for the term of 3 months beginning October 1, 1943, is approximately 79,630,000 pounds, as compared with 78,450,000 pounds for the previous contract period of 3 months.

Paragraph 76 of the General Instructions specifying Time of Shipment has been revised to permit delivery within 30 days, exclusive of Sundays and legal holidays, after receipt of order.

In consideration of the lower quality of chemical wood pulp resulting from war conditions, the bursting strengths of all book papers (except offset and coated book) and of manifold and index papers have been reduced by 10 per cent.

For the same reason the bursting strengths of chemical wood writing, bond, and of 25- and 50-per cent rag bond and ledger papers have been reduced by 10 per cent and their folding endurance by 15 per cent.

In accordance with the revised limitation order L-120 which drastically reduced the maximum weight limitations, substance 40 writing, bond and mimeo-

(Continued on page 18)

Canada May Class Wood-Cutting Essential

Appeals of Pulp and Paper Industry That Men In Lumber Camps Be Exempted From Military Service Likely To Be Acted Upon By Government—To Settle Hearst Newsprint Debts—Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., August 30, 1943—Reports from Ottawa indicate that appeals of the pulp and paper industry that wood-cutting be classed as "essential" are likely to be acted upon by the government. The industry has asked that men in lumber camps be exempted from military service and that war prisoners be assigned to such work also. Such measures would do much to forestall the threat of sharply reduced operations in the newsprint mills next year, due to inadequate 1943 cut. It has also been reported that Ottawa may revise present tax regulations as affecting the pulp and paper companies so that present drain on earnings can be eased.

Meanwhile there is general approval of the fact that, following the visit of a Congressional sub-committee to Canada looking into sources of newsprint supply, has come the announcement of a joint U. S., Canada and United Kingdom committee to report on the requirements, supplies, uses, production, and distribution of the pulp and paper industries of the three countries, this committee to include C. E. Adams, leading U. S. industrialist, and Morris Wilson, president of the Royal Bank of Canada, who is a leading authority on newsprint matters in Canada. In 1940 Mr. Wilson was appointed Lord Beaverbrook's personal representative in North America when the former was Minister of Aircraft Production for Great Britain. Prime Minister Churchill named Mr. Wilson chairman of the British Supply Council in North America in September, 1941.

Hearst Newsprint Debts

Much interest has been aroused here by the news that negotiations are under way between the Hearst companies and Canadian newsprint manufacturers for a settlement of the long outstanding Hearst debts, which are estimated to amount to well over $5,000,000. Indications are reported that the Hearst organization are willing to make a settlement at around 50 cents on the dollar. It is said that some companies may reach a settlement shortly while others are disposed to ask for better terms. It has been indicated that payments would be in cash.

While a complete statement is not available it would appear from perusal of some annual financial statements that the debts include $1,600,000 to the Abitibi Power and Paper Company, and close to the same amount to Consolidated Paper and the St. Lawrence group of companies; about $640,000 to the Donnacona Paper Company; about $500,000 to Price Brothers and Co.; and a substantial amount to the Canadian International Paper Company.

For some years auditors' reports of the various companies have mentioned these debts and pointed out that their value was uncertain. The newsprint companies held notes in regard to them, but recognized that their potential value depended on the ability of the Hearst organization to recover from financial difficulties. Meanwhile the organization has been paying cash for current purchases of newsprint. Most Canadian companies in recent years have transferred the Hearst notes from current assets to deferred assets and some have set up special reserves against possible loss.

Drain on Wood Pulp

A statement from the Canadian pulp industry in connection with the threatened shortage in the cutting of pulpwood declares that as a result of wartime necessity for other essential products, pulps and their products have been used as substitutes in many new directions. Pulp, for instance, is replacing, to some extent at least, cotton linters in explosives; pulpwood has been substtiuted for lumber and metal containers; plastics (produced by the industry) are being used for metal housings, for radios, aircraft, artillery, and navy instruments; multiwall kraft paper sacks for jute sacks; synthetic yarns made from "dissolving" pulps (such as rayon) for natural silk parachutes, and so forth.

As a result the consumption of pulp in the United States rose from 9,750,000 tons in 1940 to an estimated 11,050,000 tons in 1942.

St. Regis Sells Raymondville Mill

[FROM OUR REGULAR CORRESPONDENT]

RAYMONDVILLE, N. Y., August 28, 1943—Announcement is made here of the sale of the mill buildings and equipments of the branch owned by the St. Regis Paper Company here to the Waterfalls Paper Mills, Inc., of Maine. Among the equipment is a 110-inch Fourdrinier papermaking machine. The Maine concern is owned and controlled by Abe Cooper, president of the Bagley & Sewall Company of Watertown. The price involved in the sale of the property was not made public but is said to have been a mere fraction of the original cost of the plant. It is expected that the new owner will remove the machine and recondition it for use at the plant of the Bagley & Sewall Company. The buildings are of old construction and may be demolished. Included in the property are the main plant and a ground wood mill.

The sale of the property along with a number of tenements formerly used by employes of the mill wind up the interests of the concern in this village. The village was formerly owned by the company entirely. The railroad right of way of the Norwood & St. Lawrence Railroad Company through the village has been sold by the concern to the railroad company. The water rights connected with the paper mill were disposed of several years ago to the Northern Development Corporation. Since 1935 the plant here has been idle. A considerable amount of its equipment was salvaged by the St. Regis for use in its other branches before the sale of the property to the Waterfalls concern.

The mill was constructed in 1902 by the Raymondville Paper Company and was acquired in 1922 by the interests controlling the St. Regis.

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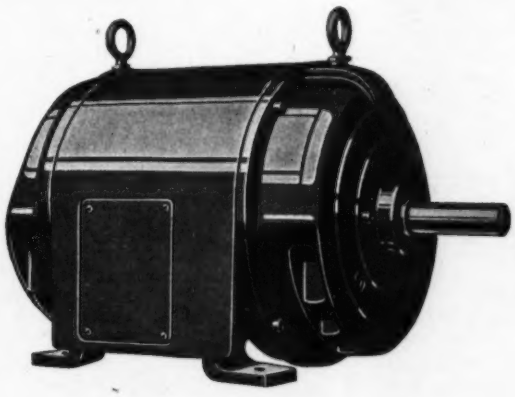

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State of Wisconsin to Aid Pulpwood Drive

Extension Forester F. B. Trenk Meets With Manufacturers' Committees To Show How State Agencies Can Render Aid—State Pulpwood Quota Now Off 25%—Mill Employment Rises—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., August 30, 1943—The State of Wisconsin has come to the fore to assist mills in obtaining enough pulpwood this winter to meet the impending shortage. F. B. Trenk, extension forester for the college of agriculture at the University of Wisconsin, has been meeting with manufacturers' committees to explain how state agencies can assist.

Mr. Trenk told mill representatives meeting at Merrill, Wis., last week under sponsorship of the Merrill Daily Herald, that the government has made a considerable financial appropriation for the pulpwood drive. It provides for the movement of labor supply into pulpwood areas for the purpose of increasing the cut.

A survey has been made by the state land commission in state-owned forests in northeastern Wisconsin, principally Marinette and Forest Counties, to determine how much wood could be cut from these areas. It was made under the direction of John M. Smith, state treasurer, who is also state land commissioner. He was assisted by Fred R. Zimmerman, secretary of state; T. H. Bakken, secretary of the Wisconsin Conservation, and a timber cruiser from the commission.

Hundreds of thousands of feet of timber are mature enough for selective cutting in the state forests, the investigators announced, and immediate arrangements will be made for auctions so the wood can be cut during the coming months. It is believed more labor can be recruited in these areas. especially among farmers, than in some other sections in more direct competition with the higher-paid war industries.

A committee was formed at the meeting at Merrill, made up of manufacturers in the Wisconsin River Valley. A goal of 60,000 cords of pulpwood was set, to be cut by farmers in Wood, Marathon, Taylor, Langlade, Oneida and Lincoln counties. Among those serving on the committee are Norman S. Stone of the Mosinee Paper Mills Company, Mosinee, and E. E. Emerson of the same company, Chester W. Cone of the Wausau Paper Mills Company, Brokaw; E. B. Hurst, chief forester of the Consolidated Water Power and Paper Company, Wisconsin Rapids; H. L. Fitze of the Tomahawk Kraft Paper Company, Tomahawk; C. J. Bronsted of the Tomahawk Pulp Company, Tomahawk; E. E. Zahn, D. B. Smith, Francis Fox, land agent of Lincoln County, and W. B. Chilsen, editor of the Merrill Daily Herald.

Efforts will be made by the committee to increase the present tire quotas allowed the pulp and paper industry for pulpwood hauling. Creameries and cheese factories will be made collecting stations for farmers bringing in small lots, and an effort will be made to use milk hauling trucks during the afternoons to bring this wood to the mills.

Wisconsin's pulpwood quota for the year is 415,800 cords, but a check made by the War Production Board shows that production up to June 30 was 156,160 cords, 25% under quota for the first half of the year.

Wood also is being made available from federal forests. Sealed bids have been called for September 10 by the U. S. Forest Supervisor, Ironwood, Mich., for lots of pulpwood to be logged in the adjacent area. Some stumpage also will be available in the Chequamegon National Forest. Bids are to be received until September 20 by the U. S. Forest Supervisor, Park Falls, Wis.

Consolidated Issues Call for Waste Paper

The Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., has called on the churches in the city and vicinity to help gather up waste paper to supply raw material for its rough grades. The mill was reported to have only a two days' supply on hand. The churches have responded, and will conduct citywide collections as a means of earning funds.

Commission to Start Plant Safety Drive

Fall months will see a new drive started by the Wisconsin Industrial Commission to cut down an alarming and continued upswing of plant accidents, a serious blow to war manpower. C. L. Miller, a member of the commission, announced that disabilities resulting from compensable injury cases in 1942 brought a total loss of 2,197,248 working days in Wisconsin industry.

Arrangements have been made for safety engineering war training classes of 16 weeks for plant safety directors in various industrial centers. Plant classes of 20 hours also will be offered for supervising personnel.

Vocational schools throughout the state also will offer night courses for industrial safety training, with eight sessions of two hours each for key employees and foremen.

Capt. F. M. Wright of the army's Sixth Service Command, with headquarters at Milwaukee, is cooperating. He is chief of the industrial safety branch.

D. B. Wilkinson to Manage Marinette Co.

Darcy B. Wilkinson has been named manager of the Marinette Paper Company, Marinette, Wis., succeeding J. C. R. Whiteley. Mr. Wilkinson formerly was personnel director of the Scott Paper Company, the parent organization, at Chester, Pa. He has already arrived to take over his new duties. He has been with the company for 20 years. Mr. Whiteley was transferred to Chester to become director of Post-war planning.

D. C. Everest Appointed Chairman

D. C. Everest, president of the Marathon Paper Mills Company, has been appointed chairman of the committee for economic development at Wausau, Wis., by C. S. Fletcher, Washington, D. C., director of field development for CED. Mr. Everest is also chairman of a similar committee of the Wausau Chamber of Commerce.

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Non Shock Service Pressure—
Cold oil, water or gas
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2½" to 3" . . . 175 pounds

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Where ease of inspection or cleaning is essential, this saddle gate valve with its U-bolt body-to-bonnet connection fits the service. It is an ideal valve for lines carrying sludge, fluids of high viscosity, or mixtures which might have a tendency to clog under the disc or between the valve seats.

Walworth No. 709 Bronze Mounted Screw End Valve has wedge, seat rings, stuffing nut, gland bonnet bushing, and stem of bronze, but the rest of the valve is made of iron. Two drain holes inside the bonnet eliminates the danger of damage due to fluid freezing in the bonnet. The sturdy construction common to both screwed and flanged end types is clearly shown.

By using Walworth Iron Body Bronze Mounted Wedge Gate Valves at this time you will help to conserve copper—a critical war metal.

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Named to Groundwood Paper Committee

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., Sept. 1, 1943—Nine representative members of the groundwood specialty papers industry were named to a Groundwood Specialty Papers Industry Advisory Committee by the Office of Price Administration today.

This committee will provide a closer working relationship between OPA and the industry. While most members of the committee reside in New York or Chicago, both large and small companies in the major geographical areas of the country where groundwood specialty papers are produced are represented.

Groundwood specialty papers, which have just been taken from the General Maximum Price Regulation and put under a new regulation, Maximum Price Regulation No. 449 (Groundwood Specialty Papers) are types of papers, excluding newsprint and other specific exceptions, which contain 26% or more of groundwood fiber and which are prepared for one or more of a large variety of end uses, the majority of which fall within the field of printing and publishing.

Initial meeting of the committee, for the purpose of electing officers and taking up other matters pertaining to organization, will be held in New York City, September 10, 1943.

The committee follows: Fred Cole, sales manager, Fraser Industries; Fred Mears, assistant sales manager, Great Northern Paper Company; Arthur Schroeder, president, Pejepscot Paper Company; Paul Mahony, sales manager, Groundwood Division, International Paper Company; and E. G. Murray, sales manager, Groundwood Division, St. Regis Paper Company, all of New York; George Fay, sales manager, Escanaba Paper Company; R. O. Warner, sales manager, Minnesota and Ontario Paper Company, and William Ward, vice-president, Watab Paper Company, all of Chicago; and Thomas Farwell, manager, Ryegate Paper Company, East Ryegate, Vt.

WPB Rules on Unused Print Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., Sept. 1, 1943—Commercial printers who have unused print paper quotas may not become publishers of magazines or books, the War Production Board advised the printing and publishing industries today.

The Printing and Publishing Division warned commercial printers, magazine publishers and book publishers that paper quotas allowed for printers under paper Limitation Order L-241 cannot be used to supplement quotas permitted for publishers under Orders L-244, covering magazines and periodicals, and L-245, covering books.

"Some commercial printers", said H. M. Bitner, Director of the Printing and Publishing Division, "have the erroneous impression that their paper quota for 1943, based upon usage during their base year of 1941 under Order L-241, may be partially used in the printing of magazines or of books. Nothing could be further from the fact, nor more contrary to the concept of those respective conservation orders.

"Orders L-244 and L-245 restrict the tonnages of paper which magazine and book publishers may put into process. It makes no difference whether the publisher, or his printer, may have additional paper physically available; paper used for such publications may come only from the publisher's quota.

"Neither is it permissible for a commercial printer, who was not an actual magazine or book publisher in 1942, to begin publishing a magazine or book in 1943 unless he has applied for and been granted a paper quota under magazine Order L-244 or book Order L-245. Any commercial printer who may be engaged in such an undertaking will be subject to investigation by the Compliance Division of WPB.

No interchange of paper quotas assigned under any of the four limitation orders (newspapers, magazines, books of commercial printing) may be made between organizations or individuals holding such quotas, without specific and advance WPB approval. This applies equally to a newspaper, magazine or book publisher who may also be a commercial printer. Restrictions apply separately to quotas provided by the individual limitation orders, and not to the sum total of the quotas, even though one organization or individual may have more than one quota.

Another question often raised by magazine publishers in connection with their paper quotas was also clarified by the WPB Printing and Publishing Division. This applies to inserts supplied publishers in finished printed form by advertisers. The Division said that any magazine insert, although furnished completely printed to the publisher, must be counted in the publisher's magazine paper quota.

Pulp and Lumber in New Association

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 30, 1943—Ontario Forest Industries Association is the name of a new organization just this week formed by a representative group of lumber, pulp and paper and associated industries, with the objective of securing utilization of the forest resources of Ontario. The announcement was made by the Hon. W. Earl Rowe, president of the Great Lakes Paper Company, who has been elected president. Wallace A. Delahey, forest engineer, and former assistant timber controller in the department of munitions and supply, has been appointed manager of the association. Vice-presidents are K. O. Roos, secretary of J. R. Booth, Ltd., Ottawa; and M. Cochran, manager of Hammermill Paper Company of Canada, Port Arthur. The treasurer of the company is Jessie E. Greer, Toronto.

Mr. Rowe's announcement points out that Canada's forests provide the raw materials for her greatest industries in respect to value of production, capital investment, salaries and wages paid, and employment. The basic objectives of the new association will be the protection and development of these industries by close co-operation with the government, and by active measures to maintain and conserve the forests of Ontario. Practical policies, based on fire protection, land classification, the formation of permanent forest reserves, and measures to combat injury from insects and diseases will be formulated and proposed by the association.

W. L. Carter Named to Finance Post

WASHINGTON, D. C., August 23, 1943—Winthrop L. Carter had been named chairman of the new War Finance Committee of New Hampshire, the Treasury announced last week. Mr. Carter is president and general manager of the Nashua Gummed and Coated Paper Company, Nashua, N. H.

2 IMPORTANT FACTS FOR Makers of Moistureproof Paper and Board!

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Specialty Bag Makers Form Institute

Twenty-seven manufacturers of Specialty and Hand-Made Bags and Envelopes met on August 18th at the Waldorf Astoria Hotel in New York City and voted unanimously to form a central organization to be known as the Specialty Flexible Container Manufacturers Institute.

The need for this new organization lies principally in the fact that many new problems of industry-wide importance have arisen from war conditions. An ever-increasing amount of its output is usefully servicing direct war packaging needs and the requirements of essential civilian supply. Not only have older products been adapted to new uses to conserve scarcer materials, but the technical skill of the companies in the Industry has developed scores of new types of containers to meet the complex packaging demands of a global war.

The newly formed Institute is designed more closely to coordinate the Industry's contribution to the war effort. To that end, it is immediately making an Industry-wide survey to determine exactly the amount of war and basic civilian end-uses it is servicing, the types of containers made for those purposes, and the amounts and types of papers and films used in their production. It is felt that this information is basic to developing increased efficiency in extending its wartime usefulness.

Gordon H. Friend of Thomas M. Royal and Company, of Philadelphia, was elected Institute President. Alfred Bleyer of A. Bleyer and Company, Brooklyn, N. Y., was elected Vice-President.

In addition to Mr. Friend and Mr. Bleyer an Executive Committee was elected consisting of Harold E. Hallman, Allied Paper Bag Corp., Baltimore, Md.; E. S. Lancaster, American Paper Goods Co., Kensington, Conn.; H. W. Stevens, Benjamin C. Betner Co., Devon, Pa.; J. W. Noonan, The Dobeckman Co., Cleveland, Ohio; C. A. Thoms, Kennedy Car Liner & Bag Co., Shelbyville, Ind.; Arthur Snapper, Milprint Inc., Milwaukee, Wis.; I. Zucker, Oneida Paper Products Co., New York City; W. L. Moore, Shellmar Products Co., Mt. Vernon, Ohio; E. Rickel, Union Bag & Paper Corp., New York, N. Y.

To facilitate the work of the Institute, four divisions were set up covering the major classifications of the Industry's products. These with the divisional Chairmen elected are: Transparent Division, W. L. Moore, Chairman, Shellmar Products Co.; Glassine and Specialty Bag Division, I. Zucker, Chairman, Oneida Paper Products Co.; Coffee Bag Division, H. W. Stevens, Chairman, Benjamin C. Betner Co.; Hand Made and Special Division, C. A. Thoms, Chairman, Kennedy Car Liner & Bag Co.

Issues New Paper Schedules

WASHINGTON, D. C., Sept. 1, 1943—New schedules of Order L-120, covering standards and simplifications for commercial envelopes, paper stationery, tablets, notebooks, pads and loose leaf fillers, as well as facial tissue, paper towels and napkins, were announced by the Pulp and Paper Division of the WPB today.

This action was taken to extend the supply of paper by setting up definite ceiling weights which may be used and to incorporate compression features which will also save shipping space. Some 229 envelope, stationery and tablet manufacturers use about 415,000 tons of paper a year, the Pulp and Paper Division pointed out.

The effect of the order will enable manufacturers to make more units or sheets from the same amount of paper, thereby not reducing the number of units available to the public. The paper will be a little thinner or lighter but otherwise very similar to the previous grades. Because of the compression feature, there will be saved approximately 1,100 carloads of shipping space which will be made available for transportation of other materials and products.

After September 30, commercial envelopes may be manufactured only from paper not exceeding 28 pounds in weight, except that manufacturers who have other stock in hand August 30, may use it provided they do so before December 28, 1943.

Envelopes with linings are no longer permitted, and limitations as to boxing and packing are also imposed. Envelopes with mechanical fasteners or closures may not include adhesives on the flap, thus conserving the supply of imported materials from which adhesives are manufactured.

After September 29, social correspondence envelopes, paper and cards are limited in weight of paper used so as not to exceed 24 pound stock for envelopes, 20 pound for paper, and 100 pound for cards.

Manufacturers of wedding invitations and announcements may use no heavier than 24 pound stock for envelopes and sheets, and 120 pound for cards. Wedding invitation sets can no longer have two envelopes per set, but may have only a single envelope.

The armed forces currently are using 12 to 14% of the total production of paper towels and approximately 10% of total paper napkin production. The present laundry situation, with its critical manpower shortage has also placed an enormous burden on paper towels, napkins and facial tissue. Manufacturers of these papers are operating at 100%. In an effort to meet demands, the new schedule provides for a reduction only of maximum basis weights and sizes which will increase the actual yardage available for the amount of raw material used.

In the case of towels and napkins old ceiling weights were reduced from 5 to 20%. Facial tissues remained at about status quo but the sizes of paper napkins were reduced from a maximum area of 400 square inches to 180 square inches. The maximum size of facial tissue is 9 by 10 inches instead of 15 by 20 inches. However an increased number of units may now be made from the same amount of paper pulp.

Basic weights of towels will now be reduced to three or four and napkins to two. Facial tissue counts in packages, or the number of units enclosed. have also been reduced to a maximum of four, and household packages of napkins have been reduced from 16 or 20 counts to only two.

Boston News Notes

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., August 30, 1943—Horace Binney Sargent, president, E. Butterworth & Co., Inc., dealers in paper stock, is spending a three weeks' vacation at Orleans, Cape Cod, Mass., expecting to return after Labor Day.

Gordon E. Emerson, treasurer of the Butterworth company, has returned from a sojoun at Rockport, Mass., on the North Shore.

Captain Leslie A. Claff, general manager of M. B. Claff & Sons, Inc., manufacturers of setup and folding paper boxes, has left to join the Allied Military Government organization.

Sets Standards in Writing Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 1, 1943—New standards and maximum weights of six categories of writing and printing papers were fixed by the War Production Board today, effective September 1. The reduction in weights in certain papers actually increases by about 15 per cent the area of paper available for commercial and governmental use, as well as for general public consumption.

This action was taken to conserve virgin fibre or wood pulp, in view of the shortage of that material, the wood from which it is made, and paper itself.

Limitation Order L-120, as amended, affects practically all paper used in publications, including newspapers, magazines and books, and all commercial printing papers, as well as writing, tablet and envelope papers, Arthur G. Wakeman, Director of WPB Pulp and Paper Division, said. While the weights or thicknesses of papers will be reduced materially, he explained, the average reader of the printed word or user of writing paper will notice little diffeence.

In effect, the amended order will materially increase the number of sheets available to serve the greatest number of essential users.

The shortage of manpower, and other limiting factors in the pulp and paper industry, Mr. Wakeman pointed out, have so curtailed the supply of woodpulps and others fibrous materials used in making paper, as to make immediate action by the WPB necessary to prevent a serious shortage of paper, paperboard and paper products for essential uses.

Many publishers, including a number of magazine and book producers, have already used lower weights of print paper in an effort to conserve paper and stretch it out further to cover a greater area, the Pulp and Paper Division said.

The order covers both simplification and standardization of paper; the heavier weights have been eliminated wherever practical and maximum weights set up.

The actual tonnage of paper produced today depends primarily on the woodpulp allocations to the various mills for making certain kinds and classes of paper, it was pointed out, but a contributing factor in extending paper production depends upon an increased use of substitute fibres and waste paper, to conserve the virgin pulp.

Specifically, weights of uncoated English (machine) finish book papers are fixed at 30, 36, 40 and 45 pounds (25" x 38"—500) except that an 85 pound paper may be used for printing music. Other book papers run up to 50 and 60 pounds, 65 for multicolor offset printing, 70 pounds for cigarette cups and 120 for certain ticket paper.

Fine writing papers are based, in the main, on 500 sheets, 17" by 22", and provide for grades running from 7 to 36 pounds, except that certain bristols may be made in weights up to 140 pounds (25½ by 30½). There are several exceptions for special types of papers such as blueprint and cover papers. Mimeograph paper is limited to a maximum of 16 and 18 pounds.

Ten kinds of paper suitable for printing magazines and covers are listed, with weights running from 39 to 70 pounds dependent upon specific uses. Novel news and newsprint are fixed at a standard of 32 pounds (24 by 36).

Special exceptions are provided to cover higher weights of papers for export, but the permission of the WPB is necessary before such papers may be manufactured for shipping abroad.

The regulations announced today are incorporated in several schedules to Order L-120, as follows:

Schedule I—Paper and paperboard for commercial printing.
Schedule II—Paper for book publishing.
Schedule III—Fine writing papers.
Schedule IV—Tablet paper.
Schedule V—Envelope papers.
Schedule XIV—Paper for newspapers or magazines.

P. E. Cooper Goes with Pacific Mills

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., August 28, 1943—Paul E. Cooper, formerly deputy director and general manager of the Thames Board Mills, Ltd., Purfleet, England, has been appointed vice-president and general manager of Pacific Mills Ltd., British Columbia pulp and paper manufacturers at Ocean Falls and Vancouver, B. C.

Selection of Mr. Cooper for the important executive post was made by the board of directors comprising Louis Bloch, C. A. Cotterell, E. W. Hamber, Mayne D. Hamilton, J. H. Lawson, A. B. Martin, C. H. Pim, W. E. Wintemute and J. A. Young.

Mr. Young continues a vice-president and treasurer, and Mr. Pim as vice-president in charge of sales, both with offices in Vancouver.

Canadian-born, Mr. Cooper, recently arrived in Vancouver preparing to take over his new duties. He was educated in Ottawa and at McGill University, where he graduated in civil engineering. He is a member of the Engineering Institute of Canada and a member of the McGill Graduate Society.

He has been in the paper business for 20 years, ever since he joined the International Paper Company as construction engineer. He participated in International's extensive construction program during the 1920's and in 1929 he was appointed resident engineer of the Piercefield mill of International Paper Company in northern New York State.

In 1933 Mr. Cooper was transferred to the Rumford mill of Continental Paper and Bag Corporation at Rumford, Me., later becoming manager there.

Soon after he resigned to join Thames Board Mills in England as chief engineer in charge of the design and construction of a new board mill at Warrington, Lancashire. When the job was completed in 1937 he took over management of the mill. While a resident of Warrington Mr. Cooper was president of the Chamber of Commerce and chairman of the Lancashire Area Waste Paper Recovery Association.

In 1941 he was appointed deputy director and general manager of the Thames Board Mills, with head office at Purfleet, Essex. The Thames Board Mills is the largest board producing and converting factory in the British Empire, producing all grades of board and converting both into solid and corrugated containers.

A. V. Howland Returns from Montana

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., August 28, 1943—Arthur V. Howland, vice-president, assistant treasurer, and general manager of Tileston & Hollingsworth Company, has returned from a month's vacation at Elkhorn Ranch, Bozman, Mont.

Forms Writing and Fine Paper Group

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 1, 1943—Twenty-one business men who are representative of the writing and other fine papers industry were appointed by the Office of Price Administration today as a Writing Paper Industry Advisory Committee.

The purpose of the committee is to establish a closer working relationship between the Office of Price Administration and the industry.

The papers manufactured by this industry have just been taken from under the General Maximum Price Regulation and put under a new regulation, Maximum Price Regulation No. 450 (Writing Paper and Certain Other Fine Papers).

Large and small companies and different geographical areas of the country are represented on the committee.

The initial meeting for the purpose of electing officers and other matters pertaining to organization will be held in New York on September 9, 1943.

The committee follows: John D. Zink, president, Strathmore Paper Company, West Springfield, Mass.; Winthrop Crane, president, Crane Paper Company, Dalton, Mass.; Joseph Holmes, president, Chemical Paper Company, Holyoke, Mass.; Edward Reid, vice-president, American Writing Paper Corporation, Holyoke, Mass.; Irving N. Esleeck, president, Esleeck Paper Company, Turners Falls, Mass.; Chester Stevens, president, Stevens Paper Mills, Windsor, Conn.; Dexter Coffin, president, Dexter Paper Company, Windsor Locks, Conn.; Clyde Morgan, president, Eastern Manufacturing Company, Bangor, Me.; Harrison Baldwin, vice-president, Hammermill Paper Company, Erie, Pa.; Hugo Hanson, president, W. C. Hamilton Company, Philadelphia, Pa.; M. Peter Schweitzer, vice-president, Peter J. Schweitzer Company, Elizabeth, N. J.; L. D. Nicholson, secretary-treasurer, District of Columbia Paper Company, Washington, D. C.; F. H. Savage, vice-president, International Paper Company, New York; Herbert W. Suter, vice-president, Champion Paper and Fiber Company, Hamilton, Ohio; Guy Beckett, president, Beckett Paper Company, Hamilton, Ohio.; H. A. Legge, assistant treasurer, Aetna-Howard-Maxwell Paper Company, Dayton, Ohio; M. D. Bardeen, president, Lee Paper Company, Vicksburg, Mich.; Harry Straus, president, Ecusta Paper Company, Pisgah Forest, N. C.; A. C. Gilbert, president, Gilbert Paper Company, Appleton, Wis.; D. K. Brown, president, Neenah Paper Company, Neenah, Wis.; Adam Remley, vice-president, Nekoosa-Edwards Paper Company, Port Edwards, Wis.

Paragraphs on Printing

William E. Rudge, 225 Varick Street, New York, N. Y., has recently printed an interesting book by Bruce Rogers entitled "Paragraphs on Printing." It is essentially a work on beautiful book design and includes many comments regarding the part played by paper in the appearance of printed material. Excellent advice is given to printers and editors of fine publications. The price of the regular edition is $10.00 and a special edition is obtainable for $25.00.

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SERVICE
THE ORR FELT & BLANKET CO.
PIQUA, OHIO
Despite all handicaps, American mills are credited with a fine production job on paper and "board," and Orr is proud to have had a part in that accomplishment.
At no time has Orr felt quality varied from the high peace time standard. At no time have felt shipments lagged behind the demand.
Orrs are available for every mill requirement—every grade or machine speed. Orr engineers are also available for study of special needs.

Obituary

F. H. Rosencrants

Fay H. Rosencrants, vice-president of the Combustion Engineering Company, Inc., 200 Madison avenue, New York, and an authority on steam-power plants and boiler design, died August 27 at his home in the Cragswold Apartments in Garth Road, Scarsdale, N. Y. He was fifty-four years old.

Mr. Rosencrants was born in Cozad, Neb., and was graduated in mechanical engineering from the University of Nebraska. He joined the International Combustion Engineering Company, Ltd., of London, as director of engineering in 1924. Six years later he became vice-president of the New York combustion company.

In the last two years Mr. Rosencrants was in charge of construction of boilers for the Navy Department and the United States Maritime Commission. He was a member of several professional societies and his clubs included the Engineers' Club of New York.

Surviving are his wife, Mrs. Mabel Worcester Rosencrantz, and two sisters.

Ward W. Pickard

Ward Wilson Pickard, former coordinator of the paper and pulp industry, died yesterday at Mountainside Hospital in Montclair, N. J., at the age of 65. He was a resident of Nutley.

Born in Wilson, N. Y., Mr. Pickard was a graduate of Wesleyan University, Middletown, Conn., and of the New York Law School. He was admitted to the New York Bar in 1902 and practiced law until 1915, when he became president of the Eagle Savings and Loan Company of Brooklyn. He was also formerly treasurer of the Seabrook Company, Bridgeton, N. J.; president of the Plains Oil Company, Wichita, Kan., and assistant to the president of the Celotex Corporation. In 1933 he was appointed head of the paper and pulp division of the NRA and the following year was named as co-ordinator of the industry, serving until 1936.

Survivors are a widow and two sons, William R. and Nicholas Pickard, and a daughhter, Mrs. Mary L. Whyte.

May Sell Mill to Mexican Interests

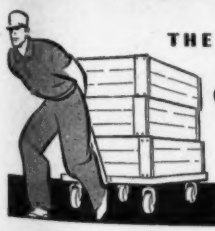
OGDENSBURG, N. Y., August 28, 1943—Rumors were current here this week that the Algonquin Paper Mills may soon be sold to Maxican interests following the disclosure that an official of the concern was on a business trip to Mexico City. A. E. Bartlett, superintendent of the plant, left here several days ago without disclosing the purpose of his trip but it was announced later that he would be gone for several weeks. Although no official word was forthcoming from the company, it is believed that he is representing the owner of the mills in conversations with the Mexican government regarding the sale of the plant. Mexican interests have evinced a desire to purchase the plant and reports of a deal have been heard here for some months past.

He's a Specialist too!

Skilled doctors concentrate on particular problems . . . solve them more quickly and efficiently because they're *specialists!*

We're specialists in solving the problem of how to dispose of job-lots and seconds for the Fine Paper Industry.

For 60 years, *Sabin Robbins* has served producers and printers . . . America's *only* nation-wide distributors, with offices in principal cities!



THE SABIN ROBBINS PAPER COMPANY · CINCINNATI, OHIO

PURCHASING OFFICE: Detroit 16, Mich. SALES OFFICES in 20 Principal Cities

NATIONAL DISTRIBUTORS OF PAPER MILL JOBS

Stabilizes Kraft Sealing Tape

WASHINGTON, D. C., September 1, 1943—Ceiling prices for gummed Kraft sealing tape were stabilized at approximately the levels of July through September 1941 by the Office of Price Administration today when manufacturers' specific dollars-and-cents maximums on the standard grade of sealing tape were established on sales to distributors.

On manufacturers' sales of other grades and to persons other than distributors, such as industrial and institutional users, customary differentials observed during October 1-15, 1941 may be added to the specific ceilings.

Today's action will reduce most manufacturers' ceilings as previously established by Maximum Price Regulation No. 129 (Certain Converted Paper Products), at the peak levels of December 1-15, 1941. The average reduction is estimated at approximately 6 per cent. The new ceilings are embodied in a new regulation Maximum Price Regulation No. 459 (Gummed Kraft Sealing Tape) effective Aug. 30, 1943.

Studies by OPA have shown that prices in effect during both October and December 1941 were inflationary in character and that the ceilings heretofore established have in effect extended the greatest reward to those contributing most to the price increase in this commodity during 1941. The new dollars-and-cents ceilings will, under current cost conditions, permit full operations by an overwhelming proportion of the industry at reasonable and adequate margins and overall profits, at least equal to those realized before the inflationary period set in, OPA said. Representative members of the industry have been consulted in the preparation of this regulation.

Today's action is in keeping with OPA's policy of providing simplified and more effective maximum prices. Gummed Kraft sealing tape, used largely for sealing packages, bundles and cartons, represents more than half the total production of the gumming industry in this country, whose total output in 1942 is estimated at $32,000,000.

Only manufacturers' prices are governed by the new regulation. Ceilings for distributors are established by Maximum Price Regulation No. 349 (Distributors' Maximum Prices For Certain Coarse Paper Products) while ceilings for retailers are governed by the General Maximum Price Regulation.

Conforming to established trade practices, three major groups of delivered dollar-and-cents ceilings are spelled out for standard gummed kraft sealing tape per 100 rolls, one inch wide, for each of four delivery zones. On the 60 pound 600 feet grade, representing about 75 per cent of the total gummed kraft sealing tape production, the less than carload ceiling in Zone 1 for brown tape is $14.75 per 100 rolls. Carload ceiling prices are established at 50 cents per 100 rolls lower than the less-than-carload ceilings.

Maximum prices for rolls having widths other than one inch must be determined on a directly proportional basis to the spelled out ceilings. Customary differentials are allowed for superstandard and special gummed kraft sealing tapes, while a formula is provided to take care of all types not otherwise covered. On sales of less than one case (16 bundles) manufacturers are permitted to add a differential not in excess of that which they customarily employed during October 1-15, 1941 between the less-than-carload price and less-than-case price.

ASK BIDS ON PAPER

(Continued from page 7)

graph papers, substance 64 ledger papers, 280-pound index papers and 160-pound book papers were eliminated from the Schedule.

Former lot number 64, Lithograph-finish Map, was renumbered as lot number 63. Lot number 65, Lithograph finish Map Paper was divided into two lots. One lot, renumbered 64, includes substances 32 and 40 and the other, lot renumbered 65, provides for substances 48 and 56.

Lots numbers 52, 129, 161, and 169 were eliminated because their weights exceeded the maximum weights permitted by the War Production Board.

The bursting strength of manila paper, lot number 213, formerly classified as Rope manila paper, was lowered because of the substitution of hemp or jute for rope as the fiber content of the paper.

Lot number 215, Drumhead Manila, was eliminated because of the difficulty of obtaining rope fibers restricted by the War Production Board.

In order to conserve sulphate (kraft) pulp, three new lots involving Imitation Kraft wrapping, numbers 220 to 222, inclusive, were added to the schedule.

In the interest of conserving metal, fiber cores are specified instead of iron cores in lots numbers 276 and 277.

WFA Moves to Get More Farm Timber

WASHINGTON, August 29, 1943—A program to enlist the nation's farmers in a campaign to meet wartime military and essential civilian needs for lumber was announced today by the War Food Administration.

It is estimated that 3,500,000 farms have woodlands, most of which can yield marketable products, the WFA said. Since the country normally depends on farm woodlands to supply one-third of its forest products each year, "these long-time requirements can be met only by keeping such woodlands fully productive," the agency added.

The program for stimulating farmers' cooperation in the drive to increase production of lumber, logs, pulpwood and other products has been developed cooperatively by the WFA, the Forest Service of the Department of Agriculture and the War Production Board. It will be carried out in the field as a part of the national food production program under direction of State and county agricultural war boards. It is expected to produce best results in Southern, Northeastern and Midwestern States, where the bulk of farm woodland exists.

Appoints Arch H. Copeland

The Diamond Alkali Company announces the appointment of Arch H. Copeland and John Berdan as assistant directors of sales. Mr. Copeland has been affiliated with the Diamond Alkali Company and its subsidiary companies as an Executive Assistant for a number of years. Mr. Berdan has been associated with the company since 1931.

Announcement is also made of the appointment of J. D. Mattern as manager of Alkali Sales covering the sale of the company's principal heavy chemical products—Soda Ash, Caustic Soda and Bicarbonate of Soda. Mr. Mattern has been a member of the sales staff since 1922.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending August 28, 1943

STOCKS

	High	Low	Last
A. P. W.	1¾	1⅞	1⅞
Armstrong Cork Co.	36¾	36	36½
Celotex Corp.	13⅛	12⅝	12⅝
Celotex Corp., pf.	19	18⅜	18¾
Certain-Teed Products Corp.	5⅜	5⅛	5⅜
Certain-Teed Products Corp., pf.	55¼	52	53
Champion Paper & Fibre Co.	20¼	20	20
Champion Paper & Fibre Co., pf.	107¼	107	107¼
Congoleum Nairn Co.	22½	21½	22⅛
Container Corp. of America	19¾	18¾	18⅞
Continental-Diamond Fibre Co.	12	11⅜	11⅞
Crown Zellerbach Co.	15¼	14⅞	15
Crown Zellerbach Co., pf.	99⅜	98	98¼
Dixie Cup Co.	13⅜	12¾	13⅜
Dixie Cup Co.—A	44¼	43¾	44
Flintkote Co.	19⅜	19	19⅛
Flintkote Co., pf.	106¼	106	106¾
Robert Gair	2¾	2½	2½
Robert Gair, pf.	12⅜	12⅜	12⅜
International Paper Co.	10¾	10⅛	10⅜
International Paper Co., pf.	58½	57	58⅛
Johns-Manville Corp.	84½	83¼	84¼
Johns-Manville Corp., pf.	132½	132½	132½
Kimberly-Clark Corp.	32	32	32
MacAndrews & Forbes	26½	25½	26⅛
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	37¾	37¼	37¾
Mead Corp.	8	7¾	7⅞
Mead Corp., pf. A—6%	85	84	85
Mead Corp., pf. B—5½%	77	76½	77
Paraffine Companies, Inc.	43	41½	43
Paraffine Companies, Inc., pf.	101	101	101
Rayonier, Inc.	14¼	13	14¼
Rayonier, Inc., pf.	32	30	30
Ruberoid Co.	27	26⅛	27
Scott Paper Co.	42½	42	42
Scott Paper Co., pf.	113	113	113
Sutherland Paper Co.	....	....	....
Union Bag & Paper Corp.	9⅝	9	9⅛
United Paperboard Co.	4¼	3¾	3¾
U. S. Gypsum Co.	69½	67¼	69½
U. S. Gypsum Co., pf.	179½	177½	177½
West Virginia Pulp & Paper Co.	15	14⅜	14½
West Virginia Pulp & Paper Co., pf.	107¼	106¼	106½

BONDS

Abitibi Pulp & Paper Co. 5s '53	....	....	....
Celotex Corp. 4½s '47	101	101	101
Certain-Teed Products Corp. 5½s '48	101¾	101½	101½
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	106⅛	106	106
International Paper Co. 5s '47	104¾	104⅛	104¼
Mead Corp. 3½s '53	....	....	....
West Virginia Pulp & Paper Co. 3s '54	104¼	104¼	104¼

NEW YORK CURB EXCHANGE

High, Low and Last for Week Ending August 28, 1943

STOCKS

	High	Low	Last
American Box Board Co.	7½	7½	7½
Brown Co., pf.	....	....	....
Great Northern Paper Co.	31½	31½	31½
Hummel-Ross Fibre Corp.	....	....	....
National Container Corp.	....	....	....
St. Regis Paper Co.	3⅛	3⅛	3⅛
St. Regis Paper Co., pf.	136¼	135½	135½
Taggart Corp.	3⅞	3¾	3⅞

BONDS

American Writing Paper Co. 6s '61	94½	94	94½

Certain-teed Earns $3.57

The Certain-teed Products Corporation and wholly-owned subsidiaries for the six months to June 30 reports net profit, after $196,679 provision for taxes, was $240,676, equal to $3.57 each on 67,373 shares of $6 preferred stock on which accumulations of unpaid dividends were $37.50 a share at end of period. This compares with net of $568,609, or $6.27 a share, on 73,069 shares of $6 preferred stock for first half of 1942 when $815,459 was provided for taxes. Above results do not include any part of earnings of Sloane-Blabon Corporation, which showed a net profit of $165,881 for first six months of 1943, against $210,169 for 1942 period.

Neither do the earnings include profit on purchase of company's debentures.

Rutile

UNITANE O-R150

TITANIUM DIOXIDE

For ECONOMY

. . . MAXIMUM OPACITY and HIGHER STRENGTH

Suitable for ALL types of paper ranging from thin printing papers and waxing tissues to coated book and magazine stocks.

UNITANE O-R150 was especially developed for paper pigmentation. Its excellent dispersion in water promotes good retention and excellent sheet formation. As a component of the beater furnish, it produces whiter sheets of great brilliance, and superior printing qualities.

SAMPLES of UNITANE O-R150 will be sent promptly upon request.

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UNITED COLOR AND PIGMENT CO.

DIVISION OF INTERCHEMICAL CORPORATION

NEWARK, NEW JERSEY

Sales Offices, Representatives and Warehouses in:

Cambridge, Cincinnati, Indianapolis, Seattle, Oakland, New Orleans, Buffalo, Pittsburgh, Detroit, Philadelphia, Cleveland, St. Paul, Chicago, St. Louis, Los Angeles

Frederic G. Coburn Heads Brown Co.

The Brown Company, Berlin, N. H., producer of pulps, paper and allied products, announces the election of Frederic G. Coburn of New York city as president of the Company. Mr. Coburn has been associated with Brown Company for the past eight months as special assistant to H. P. Kendall, who as chairman of the board served as chief executive pending the election of a president. Mr. Coburn becomes the first president of the Company since its reorganization late in 1941.

Mr. Coburn brings to Brown Company both technical and industrial training and experience in many different fields. A graduate of the United States Naval Academy and Massachusetts Institute of Technology, he was for many years an officer in the Construction Corps of the United States Navy. During the first World War he designed, constructed, and managed the Naval Aircraft Factory, the Navy's only owned aircraft plant. While connected with the Navy, he spent three years as a part-time lecturer on the faculty of the Graduate School of Business Administration of Harvard University. His subsequent experience includes an executive position with Bethlehem Shipbuilding Corporation, Ltd., and eighteen years with Sanderson & Porter, engineers, in which firm he became a partner. Mr. Coburn, as chief executive officer of the Aviation Corporation, organized its business and that of its subsidiary, American Airways, Inc. (now American Airlines, Inc.). For several years he was engaged as president in the reorganization of McLellan Stores Company, and later was President of Air Associates, Inc.

Other officers were reelected as follows: E. H. Maling, vice-president in Charge of Finance and Accounts, and Treasurer; W. L. Campbell, vice-president in Charge of Manufacturing; H. E. Houghton, vice-president in charge of sales; R. W. Bowlen, assistant treasurer and assistant secretary; R. H. Marshall, comptroller; J. B. Hopkins, secretary; and L. A. Pierce, clerk.

All present members of the board of directors were reelected and Mr. Coburn was added. The directors are: Robert Brau, Portland, Maine; Orton B. Brown, Berlin, N. H.; J. B. Challies, Montreal, Canada; Frederic G. Coburn, New York City; John H. Fahey, Swampscott, Mass.; G. Blair Gordon, Montreal, Canada; John J. Hagerty, Boston, Mass.; H. P. Kendall, Boston, Mass.; and Laurence F. Whittemore, Pembroke, N. H.

The Brown Company reorganization was effected through a Reconstruction Finance Corporation loan which has since been reduced substantially.

G. N. Carleton to be Gen. Supt.

DETROIT, Mich., August 28, 1943—The Detroit Sulphite Pulp and Paper Company announces the appointment of George N. Carleton as general superintendent to succeed Robert F. Kohs who has retired. Mr. Carleton started with the company sixteen years ago. He has been assistant general superintendent the past six years.

BE SURE Your Plans Include
Kalamazoo Vitrified
Glazed TILE Construction
for Stock Tanks and Chests

Production Savings and Efficiency

Specify the finest material ever developed for paper and pulp mill tanks and chests. The hard, smooth, glazed surface is ideal for machine chests, bleach tanks, and all storage tanks and chests.

Keeps your stock free from rust, chipped, or flaked concrete and is not affected by most chemicals.

Your first cost is your only cost, with no shutdowns for expensive repairs. Why not have the best when your investment is no more than reinforced concrete or 3 inch cypress chests or tanks?

The Kalamazoo exclusive method of construction is easily adapted to any shape or size with round or square ends, midfeathers, fins or agitators and tapered bottoms and rounded corners.

Saves in three ways by—lowering investment—reducing maintenance—and stepping up production.

Ask for Engineering Data

Kalamazoo TANK & SILO CO.
KALAMAZOO - MICHIGAN

Acme Paper Co. Starts

MEMPHIS, Tenn., August 30, 1943 —"Everything in Paper" is the slogan of Memphis' newest wholesale paper firm, Acme Paper Company, 708 Linden street. Leo C. Wurtzburger, general manager, heads the firm.

Establishment of the company marks the realization of a lifetime ambition of Mr. Wurtzburger, who has had 37 years of experience as a paper sales, executive.

As a youngster of 15, he entered the paper business as an office boy in 1906. He passed through practically every department to acquire knowledge and experience.

Mr. Wurtzburger was a pioneer in development of the manufacture and sale in this territory of folding paper boxes, garment bags and other paper specialties. He has developed many of his own ideas in converting raw materials into finished products. He plans development of many new items especially adapted to independent chain stores and the syndicate field.

Acme Paper Company occupies a modern building containing more than 25,000 square feet of space. The firm has a huge stock of paper products assembled in the face of curtailed supply.

Walter F. Gilliland, with more than 16 years in the paper business in this area, is assistant manager. He moved to Memphis from Little Rock.

Appeals for Expansion in Pulpwood Production

Gov. Kelly of Michigan has appealed to Michigan farmers, timberland owners and operators to do everything within their power to increase the production of pulpwood.

The Michigan department of conservation is cooperating with the United States forest service in setting up a program to facilitate such production, particularly in connection with small operators and farmers, the governor's statement said.

This program is already well under way, it was pointed out, and field representatives of the forest service, conservation department, extension service, soil conservation service and the University of Michigan have been assigned to specific areas in the state to aid operators and farmers.

In order to get a true picture of the labor situation, the first assignment given these men was to contact all wood products and saw mill operators to discover their labor needs and difficulties, the statement said. This data will be compiled and presented to the war production board.

HARK to the story of Wet-End Fat
who had no hate for wires
But who saw the food truck coming toward him
almost past the driers.
So he quick ate up his pork-chop
and threw the bone at the trough.
But Fat was in such a hurry that
his aim was a little off.
The bone just ticked the railing,
bounced and flew to the wrong side.
So they shoved Fat through the dandy roll
and watermarked his hide.

When trained crews keep debris off the wires and take the other normal precautions a good wire deserves, your Cheney Bigelow Wires deliver all the fine service you've come to expect of them. For we're keeping quality *up* by keeping our skilled craftsmen *on*. Though we now produce large quantities of vital war items, we also continue to develop and manufacture Fourdrinier wires and other mill equipment . . . with full government approval, for paper, too, is a weapon.

CHENEY BIGELOW

Fourdrinier Wires • • Dandys • • Cylinders • • Wire Cloth

CHENEY BIGELOW WIRE WORKS · 417 LIBERTY STREET · SPRINGFIELD, MASS.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 117 September 2, 1943 No. 10

COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Palmer House, Chicago, September 21-24, 1943.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

POST-WAR EMPLOYMENT

Although the victorious end of the war for the Allies cannot be predicted to a definite date, some of the many problems arising from the conflict can be foreseen. The Atlantic Charter is richly embellished with promises and assurances for many nations in the world. Whatever commitments the American people may eventually decide to make on a global scale, there is one great American problem that must be solved to our best ability. That problem is employment. It must necessarily begin as a first step in the readjustment from war to peace. It is an economic problem with great social and political consequences and it is not too early for every employer to think about it and for all our leaders to seriously discuss its many important ramifications. This is being done by many forward-looking industrial, labor, political and social leaders.

An earnest discussion of the subject was presented in an address by Fowler McCormick, president of the International Harvester Company of Chicago, before the meeting on Democracy and Jobs at the National Chamber's War Council in New York last April. In the early part of his address Mr. McCormick said in part that the words, "Democracy and Jobs" really belong together. In the first place we have learned that jobs in our sense of the word, that is to say, jobs characterized by relative freedom of choice don't exist under any form of society but a democracy. Jobs in countries under authoritarian rule are simply slavery to a greater or lesser degree. Secondly, it can well be held that democracy cannot exist in today's world unless it furnishes jobs for all who are willing and able to work. Looking abroad, we have seen the rise of authoritarian governments in countries in which unemployment on a large scale prevailed. There seems to be little question that people today will insist that there shall be no more lasting widespread unemployment even at the cost of endangering the strength of our democratic institutions. This naturally creates a challenge of the most serious nature to those who believe deeply in democracy as a way of life."

Continuing to discuss the important consideration and by whom the problem of unemployment can be solved, Mr. McCormick went on to say that, "It seems to me that the most reasonable answer is that all groups, government, labor, agriculture and industry working together will solve the problem. Government will not assume the full responsibility because . . . this leads to the end of free institutions and free working conditions. The most important thing that government can do to prevent unemployment is to create an economic and social climate in which private enterprise and free employment can thrive. In addition to that, it is the government's rightful place, it seems to me, to back up the free enterprise system by practicable social security provisions and some degree of federal, state and municipal employment when fluctuations in the business cycles make that necessary. Agriculture and labor can be of the greatest importance in furthering full employment by their cooperation and by promoting economic conditions which will stimulate and not hamper industrial growth and activity."

In touching on the subject of the place of industrial leadership Mr. McCormick said in part: "In the first place, we must remember that healthy industry is naturally interested in sound expansion. It is not normal for business to want to produce less goods and employ fewer people. Secondly, industry, in line with the thoughts presented above, knows that if it is not successful in providing full employment, government, under the conditions and expectations existing today, will undertake the task and industry knows too well the results. Thirdly, I believe that industrial leadership today is preparing itself to assume more responsibilities than it has felt were its part in the past. It must be remembered in this connection that responsible industrial leaders cannot make promises which they are not reasonably sure of being able to fulfill. They are, however, it seems to me, at the point at which they are preparing to commit themselves to an effort far broader than they have undertaken to date."

In conclusion Mr. McCormick said, in discussing that industry must assume further responsibilities. "Therefore, to my mind, it cannot promise

that it will achieve the goal we have been discussing. It can promise, however, that it will devote its fullest energies to it and that it will consider it as important as any other goals toward which it has set its face . . . the same determined, hard hitting qualities which have brought it success in the past, will bring great progress toward the ultimate goal of relatively continuous full employment with abounding benefit to all."

Government to Drive for More Straw

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 1, 1943—In an effort to increase strawboard production, the Pulp and Paper Division of the War Production Board is cooperating with the War Food Administration in a program designed to increase the collection of straw in various midwestern states. Due to the heavy rains and flood conditions this spring, a substantial portion of the available straw crop was destroyed, thereby adding to an already critical supply situation.

Baled straw is consumed by strawboard mills in the production of container-board materials which go into the manufacture of shipping containers. Due to the very heavy requirements of the military forces and essential civilian demands, it is necessary to take every possible step to increase the supply of container-board and shipping containers to provide packaging for vital materials.

The proposed plan will result in State War Boards and County War Boards assisting strawboard manufacturers to locate available straw. Farmers in the straw producing areas will be urged to make this product available. The strawboard producers will cooperate in this program and assist the famers in disposing of their straw as pomptly as possible.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1943		Corresponding Weeks—1942	
July 17	90.3	July 18	81.5
July 24	90.5	July 25	79.2
July 31	91.5	Aug. 1	81.0
Aug. 7	90.0	Aug. 8	81.4
Aug. 14	91.6	Aug. 15	77.5
Aug. 21	*91.1*	Aug. 22	81.2

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1942	104.5	103.9	102.9	100.4	95.3	87.4	75.8
1943	87.2	88.9	89.5	88.7	91.5	86.5	*84.5*
Year		Aug.	Sept.	Oct.	Nov.	Dec.	Avg.
1942		80.8	82.8	90.6	86.9	80.1	90.4
1943		....	....	....	....	....	....

COMPARATIVE YEARLY SUMMARIES

	1936	1937	1938	1939	1940	1941	1942	1943
Year to Date..	77.9	87.3	68.5	78.7	86.9	94.2	93.8	*88.5*
Year Average..	80.4	79.8	71.5	83.4	85.6	97.4	90.4	....

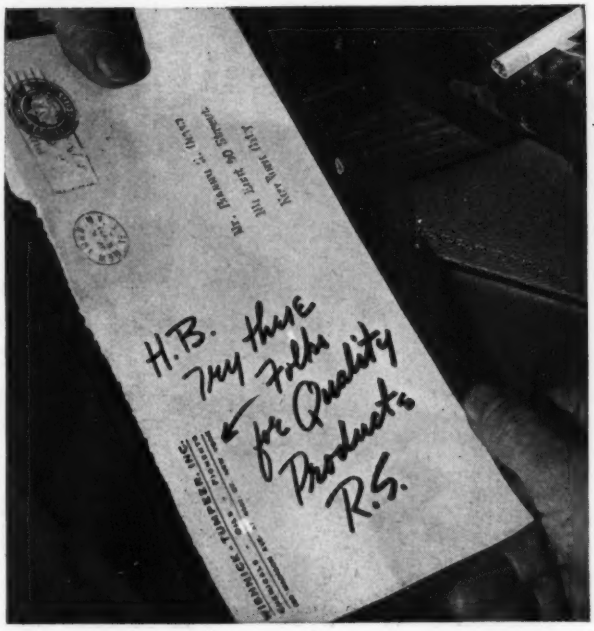
* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Avg.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	60	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	84
1943	86	88	94	94	96	94	*89*	..	..	..	..	..	..

Week ending July 17, 1943—91
Week ending July 24, 1943—97
Week ending July 31, 1943—97
Week ending Aug. 7, 1943—94
Week ending Aug. 14, 1943—98
Week ending Aug. 21, 1943—*95*

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.



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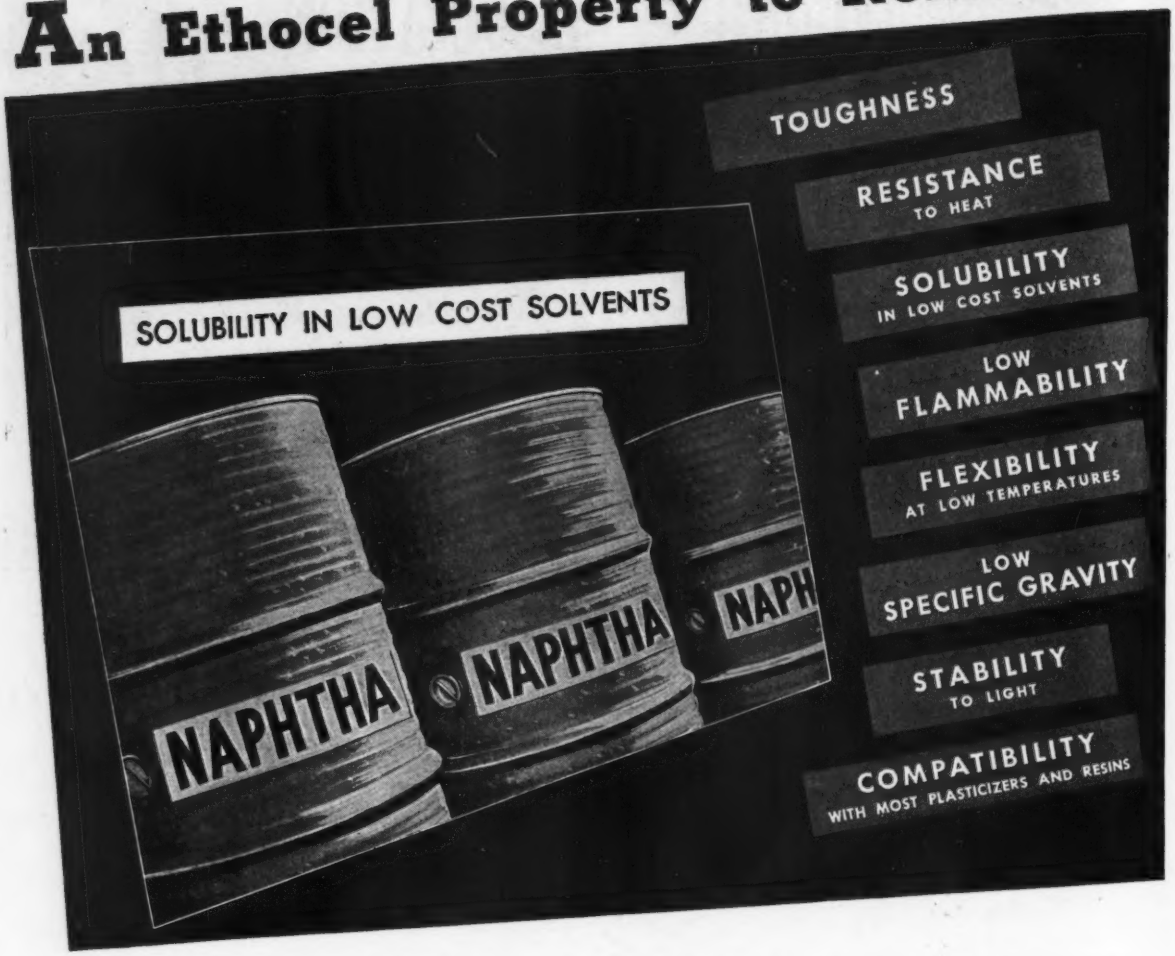
An Ethocel Property to Remember



Today, solubility in low cost solvents means solubility in *available* solvents. It may seem paradoxical, but one of the factors which has contributed to the present ETHOCEL shortage is its solubility in readily available low aromatic naphthas. Materials commonly considered diluents are active solvents for ETHOCEL.

Thus, any naphtha having a Kauri Butanol value of 50 or over can be used in many ETHOCEL lacquer compositions as the sole solvent. Higher solids content can be obtained through the addition of a small percentage of alcohol.

After the war, when quality at low cost again becomes the measuring stick of industry, the experience gained in making diluents do the work of solvents will increase the savings to both the coating manufacturer and his customers.

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TO INDUSTRY AND VICTORY

Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

Lignin in Wood*

TAPPI Tentative Standard T 13 m-43

When wood is treated with strong acids the carbohydrates are hydrolyzed, leaving an insoluble residue which is determined as lignin. Since some of the wood extractives would remain insoluble with lignin, these are first removed by proper solvents. The 72% sulphuric acid method for lignin contains two and sometimes three preliminary extractive treatments, namely: (1) with alcohol, to remove the catechol tannins; (2) with alcohol-benzene solution, to remove the resins, oils, fats and waxes; and (3) with hot water, to remove the remaining water - soluble materials.

The alcohol extraction is necessary in analysis of woods high in tannin—i.e., oak, chestnut, redwood, etc. It has not been shown necessary in the more common pulpwoods, such as the various species of spruce, pine, fir, hemlock, poplar, birch, beech, and maple. It is recommended that for these woods the alcohol extraction be omitted unless it is desirable for a special purpose. In analysis of woods not listed, the desirability of the alcohol extraction depends upon the purpose of the analysis and the report should state whether or not alcohol extraction was used.

For lignin in wood pulp, *see* TAPPI Standard T 222 m.

Apparatus

1. *Filtering crucibles.* Alundum, porous porcelain, or fritted glass crucibles (all of fine porosity), or Gooch crucibles with an acid-washed asbestos mat, are recommended for filtering the separated lignin. (Glass crucibles cannot be used if the lignin is to be ashed.)

2. *Extraction apparatus.* A Soxhlet apparatus is preferable, consisting of *(a)* Soxhlet extraction flask, 250 ml. capacity; *(b)* Soxhlet extraction tube, inside diameter 45 to 50 mm., capacity to top of siphon approximately 100 ml.; *(c)* condenser; *(d)* extraction crucibles of alundum or fritted glass and of medium or fine porosity. The extraction tubes specified siphon more rapidly than extractors with higher siphon tubes.

Reagents

A. *Alcohol-benzene solution.* Mix 33 volumes of approximately 95% ethyl alcohol and 67 volumes of C.P. benzene.

B. *Sulphuric acid, 72%.* Carefully pour 665 ml. of conc. H_2SO_4 into about 300 ml. of water and, after cooling, dilute to 1 liter. Standardize against standard sodium hydroxide solution, using methyl orange indicator. Adjust the acid to a strength of 72 ± 0.1%, by addition of water or conc. H_2SO_4 as may be found necessary.

Note: As conc. H_2SO_4 varies somewhat in strength, the measurement does not have to be made accurately; it may be done with a liter graduate. The proportions given are for conc. H_2SO_4 of 96% strength and 1.84 sp. gr.

If desired, the solution may be standardized by an accurate determination of its specific gravity. For 72% H_2SO_4 the sp. gr. at 20°/4° C is 1.6338; and at 60°/60° F or 15.56°/15.56° C it is 1.6389. A variation of 0.1% in the strength of the acid at this concentration causes a change of 0.0012 in the specific gravity.

Test Specimen

The test specimen shall consist of sawdust that has previously been ground to pass a 40-mesh sieve, and thoroughly air-dried. (*See* TAPPI Standard T 11 m.)

Procedure

Weigh accurately two samples of sawdust of approximately 1 gram each in tared glass-stoppered weighing bottles. Dry in an oven for 2 hours at 100-105° C.; replace the stopper; cool in a desiccator; loosen the stopper to equalize the pressure; and weigh. Continue the drying for 1-hour periods until the weight is constant. Calculate the percentage of moisture-free sawdust.

Weigh in the extraction crucibles two additional 1-gram samples for the lignin determination in duplicate. Place the extraction crucible containing the sample in a Soxhlet apparatus. Extract with 95% alcohol for 4 hours, unless the sawdust is known not to contain catechol tannins, in which case this extraction with alcohol is unnecessary. Then extract the sample with alcohol-benzene solution according to TAPPI Standard T 6 m. Remove as much of the solvent by suction as possible and wash with 50 ml. of alcohol by suction to remove the benzene. Remove the excess alcohol, transfer to a beaker, and digest with 400 ml. of hot water in a steam or hot-water bath at approximately 100° C. for 3 hours. Filter, wash with 100 ml. of hot water, and finally with 50 ml. of alcohol to facilitate the removal of the sawdust from the crucible. After these preliminary extractions, let the sample dry in the air.

Transfer the air-dried sample to a glass-stoppered weighing bottle or a small beaker with a watch-glass cover and add slowly with stirring 15 ml. of cold (12-15° C.) 72% H_2SO_4. The sample must be well mixed by stirring constantly for at least 1 minute.

*This method has been approved as a tentative standard by the Chemical Methods Committee. Criticisms are earnestly requested and should be sent to R. G. Macdonald, Secretary, Technical Association of the Pulp and Paper Industry, 122 E. 42nd St., New York 17, N. Y.

Allow to stand for 2 hours with frequent stirring at a temperature of 18-20° C. A water bath may be necessary to keep the temperature within these limits. Wash the material into a 1-liter beaker or Erlenmeyer flask, dilute to a 3% acid concentration with 560 ml. of distilled water, and boil for 4 hours under either a reflux condenser or a nearly constant volume condition by the occasional addition of hot water to the flask.

After allowing the insoluble material to settle, filter into a filtering crucible which has previously been dried at 100-105° C. and weighed in a glass-stoppered weighing bottle. Wash the residue free of acid with 500 ml. of hot water, dry the crucible and contents in an oven for 2 hours at 100-105° C., place in the weighing bottle, cool in a desiccator, loosen the stopper of the bottle, and weigh as lignin. Repeat the drying and weighing until the weight is constant.

If a correction for ash is desired, transfer the lignin to a tared platinum crucible and determine the ash content in the usual manner. If the lignin cannot be quantitatively transferred, it may be ashed in the filtering crucible, provided the latter has been ignited to constant weight before filtration of the lignin residue. (Ignition cannot be performed in fritted glass crucibles.)

Report

The weight of lignin shall be reported as a percentage by weight of the moisture-free unextracted wood. If the wood was extracted with alcohol or if the lignin was corrected for ash, the report shall so state.

References

Bray, M. W. *Paper Trade J.* 87, No. 25:59 (Dec. 20, 1928).
Ritter, G. J., Seborg, R. M., and Mitchell, R. L. *Ind Eng. Chem., Anal.* Ed. 4, 202 (1932).
Ritter, G. J., and Barbour, J. H. *Ind. Eng. Chem., Anal. Ed.* 7, 238 (1935).

Lignin in Wood Pulp*

TAPPI Tentative Standard T 222 m-43

When wood pulp is treated with strong acids the carbohydrates are hydrolyzed, leaving an insoluble residue which is determined as lignin. A preliminary extraction with alcohol-benzene is recommended to remove resins, which, if allowed to remain in the pulp, would remain insoluble with the lignin.

For Lignin in Wood, *see* TAPPI Standard T 13 m.

Apparatus

1. *Filtering crucibles.* Alundum or porous porcelain (both of fine porosity), or Gooch crucibles with an acid-washed asbestos mat, are recommended for filtering the separated lignin.

2. *Extraction apparatus.* A Soxhlet apparatus is preferable, consisting of *(a)* Soxhlet extraction flask, 250 ml. capacity; *(b)* Soxhlet extraction tube, inside diameter 45 to 50 mm., capacity to top of siphon approximately 100 ml.; *(c)* condenser; *(d)* extraction crucibles of alundum or fritted glass and of coarse or medium porosity. The extraction tubes specified siphon more rapidly than extractors with higher siphon tubes.

Reagents

A. *Alcohol-benzene solution.* Mix 33 volumes of approximately 95% ethyl alcohol and 67 volumes of C.P. benzene.

B. *Sulphuric acid, 72%.* Carefully pour 665 ml. of conc. H_2SO_4 into about 300 ml. of water and, after cooling, dilute to 1 liter. Standardize against standard sodium hydroxide solution, using methyl orange indicator. Adjust the acid to a strength of 72 ± 0.1%, by addition of water or conc. H_2SO_4 as may be found necessary.

Note: As conc. H_2SO_4 varies somewhat in strength, the measurement does not have to be made accurately; it may be done with a liter graduate. The proportions given are for conc. H_2SO_4 of 96% strength and 1.84 sp. gr.

If desired, the solution may be standardized by an accurate determination of its specific gravity. For 72% H_2SO_4, the sp. gr. at 20°/4° C is 1.6338; and at 60°/60° F or 15.56°/15.56° C. it is 1.6389. A variation of 0.1% in the strength of acid at this concentration causes a change of 0.0012 in the specific gravity.

Test Specimen

The test specimen shall consist of a representative portion of the pulp which has been thoroughly air-dried. Any large pieces should be broken down by disintegration or torn apart by hand.

Procedure

Weigh accurately two samples of pulp of approximately 2 grams each for the lignin determination. Weigh at the same time two samples of approximately 1 gram each in glass-stoppered weighing bottles for determination of the moisture content. Dry the moisture samples in an oven for 2 hours at 100-105° C., replace the stoppers, cool in a desiccator, loosen the stoppers to equalize the pressure, and weigh. Continue the drying for 1-hour periods until the weight is constant. (If preferred, the moisture samples may be dried overnight at 100-105° C. and a constant weight assumed.) Calculate the percentage of moisture-free pulp.

Transfer the lignin samples to extraction crucibles, place in a Soxhlet apparatus, and extract with alcohol-benzene solution according to TAPPI Standard T 6m. After completion of the extraction, spread out the sample and let it dry thoroughly in the air.

Transfer the air-dried sample to a glass-stoppered weighing bottle or a small beaker with a watch-glass cover and add slowly with stirring 40 ml. of cold (12-15° C.) 72% H_2SO_4. The sample must be well mixed and freed of lumps by stirring constantly for at least 1 minute and longer if necessary. Allow to stand at a temperature of 18-20° C. for 2 hours after the pulp has completely dispersed in the acid, with frequent stirring. A water bath may be necessary to keep the temperature within these limits. Wash the material into a two-liter beaker or Erlenmeyer flask, dilute to a 3% acid concentration with 1500 ml. of distilled water, and boil for 4 hours, under either a reflux condenser or a nearly constant volume condition by the occasional addition of hot water to the flask.

After allowing the insoluble material to settle filter

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into a filtering crucible which has previously been dried at 100-105° C. and weighed in a glass-stoppered weighing bottle. Wash the residue free of acid with 500 ml. of hot water, dry the crucible and contents in an oven for 2 hours at 100-105° C., place in the weighing bottle, cool in a desiccator, loosen the stopper of the bottle, and weigh as lignin. Repeat the drying and weighing until the weight is constant.

Report

The weight of lignin shall be reported as a percentage by weight of the moisture-free pulp.

References

Bray, N. W. *Paper Trade J.* 87, No. 25:59 (Dec. 20, 1928).
Ritter G. J., Seborg, R. M., and Mitchell, R. L. *Ind Eng. Chem. Anal. Ed.* 4:202 (1932).

Pentosans in Pulp*

TAPPI Tentative Standard T 223 m-43

In this method the furfural formed by the action of hot hydrochloric acid on the fibrous material is distilled from the mixture in essentially the manner prescribed by the A.O.A.C. *(3)*. The distillates are analyzed for furfural by a rapid volumetric procedure requiring no complicated apparatus. The volatile material, probably hydroxmethylfurfural, arising from the action of HCl upon the cellulose in the samples is corrected for in a simple manner. The correction, expressed as a pentosan, was found to be valid for the typical chemical wood fibers. This correction is described by Launer and Wilson *(1)*, who also show that the pentosan values for cotton fiber are negligible, being probably less than 0.2%.

For determination of Pentosans in Paper *see* TAPPI Standard T 450 m.

Apparatus

For the distillation a 300-ml. separatory or dropping funnel is mounted in the neck of a 500-ml. distilling flask, which in turn is connected to a long water-cooled condenser. The condenser delivers through an adapter into a 1-liter glass-stoppered reagent bottle which is used as a receiver and subsequently as a reaction vessel. Rubber stoppers may be used to make the connections. If the temperature of the condensate in the receiver is 30° C. (86° F.) or over, owing to inefficient cooling or high laboratory temperature, a small U trap, containing glass beads and 5 ml. of water, should be used to close off the system. For this purpose the reagent bottle may be provided with a rubber stopper during the distillation procedure.

Reagents

A. *Hydrochloric Acid,* 3.5 *N* (12%). Dilute 307 ml. of C.P. conc. HCl (sp. gr. 1.18-1.19) to 1 liter.

B. *Ice,* preferably frozen from distilled water. Ordinary commercial ice is satisfactory if uniform values for the blank determinations *(see* below) are obtained with it.

C. *Potassium Iodide Solution,* 10%. Dissolve 10 grams of C.P. KI in 90 grams of water.

D. *Sodium Thiosulphate Solution,* 0.1 *N*. Dissolve 25.3 grams of C.P. $Na_2S_2O_3 \cdot 5H_2O$ in water containing 1 ml. of 1 *N* NaOH and dilute to 1 liter. This gives a solution slightly stronger than 0.1 *N*, but subsequent calculations are thus made easier. After one week, standardize the solution against 0.1 *N* permanganate as follows:

Add 120 ml. of approximately 6 *N* H_2SO_4 to 320 ml. of water in a 1-liter glass-stoppered reagent bottle. Follow with 10 ml. of 10% KI solution and then, after shaking, add 50 ml. of standard 0.1 *N* $KMnO_4$ solution from a pipet. After shaking again, titrate with thiosulphate solution, adding starch indicator toward the end of titration.

E. *Potassium Bromate-Bromide Solution,* 0.2 *N*. Dissolve 5.57 grams of C.P. $KBrO_3$ and 50 grams of C.P. KBr in water. Add 1 ml. of *N* NaOH and dilute to 1 liter. The solution is not standardized, but blank determinations against the thiosulphate solution are made at intervals, as described below.

Test Specimen

The test specimen shall be representative of the sample, and shall be reduced to an open fluffy form in a disintegrator of the Koerner type *(2)*, or by tearing apart by hand, and then thoroughly mixed.

Procedure

Allow the sample to come to moisture equilibrium with the atmosphere of the balance. Weigh, to the nearest milligram, duplicate 1-gram samples of the air-dry material for the pentosan determination. Weigh at the same time specimens for the determination of moisture. Introduce the test specimen into the distilling flask through a clean, dry glass tube so as to avoid adherence of fibers to the neck of the flask. Add 100 ml. of 3.5 *N* HCl to the flask, marking the flask to indicate this volume. Then fit the dropping funnel, containing 300 ml. of 3.5 *N* HCl, in the neck of the flask and apply heat from a burner. As soon as distillation begins, let the acid drip from the funnel at such a rate that the level in the flask remains constant. Continue the distillation at a uniform rate for 100 minutes, during which period 300 ml. of condensate should have been collected. It is important to observe time and quantity. The rate of distillation can be observed by marking the receiver at 100, 200, and 300 ml.

Add 50 ml. of water to the condensate (if a trap was used, as described above, combine its contents with the condensate and add correspondingly less water) and then add 250 grams of crushed ice. After the temperature of the mixture has fallen to 0° C. or lower, add 20 ml. of 0.2 *N* bromate-bromide solution from a pipet with minimum agitation, close the bottle promptly with a ground-glass stopper, shake well, and let stand for exactly 5 minutes. The temperature should still be 0° C. or lower. Then remove the stopper, add 10 ml. of 10% KI from a small graduate and replace the stopper as quickly as possible. Shake the mixture thoroughly to allow absorption of the Br vapor and titrate with 0.1 *N* thiosulphate solution until colorless, using starch indicator toward the end of the titration.

Determine the blank in exactly the same manner, using all reagents, including the ice, except that the

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starting point is 270 ml. of 3.5 *N* HCl, diluted to 350 ml., instead of 300 ml. of condensate plus 50 ml. of water.

Calculation of Results

The pentosan content of the pulp is calculated by substitution in the following formula:

$$\text{Pentosans, per cent} = \frac{7.5\,N\,(v_2 - v_1)}{W} - 1.0;$$

where N = normality of thiosulphate solution,
v_1 = volume of thiosulphate solution used in test.
v_2 = volume of thiosulphate solution used in blank, and
W = weight of specimen after correcting for moisture.

Note: The factor 7.5 is the product of $\frac{100 \times 0.048}{0.727 \times 0.88}$, where 1 ml of *N* thiosulphate solution, 0.727 is the theoretical 0.048 is the weight of furfural in grams corresponding to conversion factor of pentosans to furfural, and 0.88 is a factor to compensate for the incomplete conversion of pentosans to furfural. The correction factor of 1.0 is applied to compensate for the hydroxymethylfurfural arising from the cellulose.

The factor 0.88 is based upon the observation that the yield of furfural from xylose is 88% of the theoretical in this method of distillation. The corresponding value for arabinose is 74%, and a furfural yield of 80% is frequently taken as an approximate average in calculating furfural yields to pentosans. However, since xylan constitutes most if not all of the pentosans in wood pulp, it appears preferable to use the factor 0.88. If both araban and xylan are present, the above equation becomes 2

$$\text{Pentosans, per cent} = \frac{8.25\,N\,(v_2 - v_1)}{W} - 1$$

This equation, with the omission of the 1.1% correction, gives values which are comparable with those obtained by using Krober's tables, in which the conversion of pentosans to furfural is also arbitrarily taken as 80%.

The factors 0.80 and 0.88 which are applied to compensate for the incomplete conversion of pentosans to furfural are somewhat arbitrary. If the analyst desires values in which these factors do not appear, and in which the furfural actually obtained is converted to equivalent pentosans, a *minimum pentosan content* may be calculated by the equation:

$$\text{Pentosans, per cent} = \frac{6.80\,N\,(v_2 - v_1)}{W} - 0.9,$$

where the factor 6.80 is the product of $\frac{1.03 \times 0.0480 \times 100}{0.727}$.

The factor 1.03 is the correction necessary to account for the destruction of furfural during the distillation. The significance of the contsant 0.9 is explained above.

The correction constant for hydroxymethylfurfural (1.0, 0.9, or 1.1) applies to wood pulps. For rag pulps and cotton the constant is somewhat lower.

Report

The pentosans shall be reported as a percentage of the moisture-free pulp. All determinations of pentosans shall be made in duplicate, the results of which shall agree within 0.4 or less, and the average shall be expressed to the nearest 0.1.

Literature Cited

1. Launer, and Wilson. "Determination of Pentosans in Pulps and Papers." *J. Research Natl. Bur. Standards* 22, 471 (1939), *Research Paper* RP1199.
2. Burton and Rasch. "The Determination of the Alpha-cellulose Content and Copper Number of Paper." *J. Research Natl. Bur. Standards* 6, 603 (1931), *Research Paper* RP295.
3. Assoc. Official Agricultural Chemists. "Methods of Analysis," 4th ed. (1935), p. 344.
4. Wehmer, P. F. "Hydrogen Ion Concentration and Pentosans." *Tech. Assoc. Papers* 23, 446-8 (June, 1940).

Micromeritics

The Pitman Publishing Company has recently published an interesting volume of 428 pages on Micromeritics, The Technology of Fine Particles by J. M. Dallavalle, Consulting Engineer. Behavior and characteristics of particles ranging in size from microscopic resolution to visibility by the naked eye are treated. Particle measurement, size, distributions, packaging arrangements, physical properties and industrial applications are fully discussed. The author stresses fundamental aspects of particle measurement and physical and chemical behavior. Included in its contents are the following topics: Dynamics of Small Particles; Shape and Size of Particles; Methods of Particle-Size Measurement; Theory of Sieving and Grading of Materials and Capillarity. The book is highly mathematical and involves a knowledge of calculus. Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 E. 42nd Street, New York, N. Y., at $8.50 per copy.

TAPPI Notes

Joseph C. Pullman, formerly of the Lily Tulip Company is now in the research department of the American Cyanamid Company, Stanford, Conn.

Prof. C. B. Purves will succeed Prof. Harold Hibbert in the Division of Cellulose Chemistry, McGill University, Montreal, P. Q., on September 1st. Dr. Hibbert who is retiring will be located in the Faculty Club, 3450 McTavish St., Montreal, P. Q.

A feature of the TAPPI Army and Navy Requirements Conference, Palmer House, Chicago, Ill., Sept. 21-24 will be addresses by Rear Admiral W. B. Young (SC) Paymaster General of the Navy and Brig. General E. E. McMorland of the Office of the Chief of Ordnance. Twenty-five hundred Navy contractors have been invited to attend the Conference. Governor Greene of Illinois is also expected to be a speaker.

Change in TAPPI Standard T 448 m-41

TAPPI Standard T 448 m-41 for Water Vapor Permeability of Paper and Paperboard provides for two alternate procedures. As a result of investigations at the National Bureau of Standards, it has been found that Procedure B, the Water Method, does not give consistent results on certain types of modern papers. The TAPPI Standards Committee has therefore withdrawn Procedure B from this standard on the recommendation of the Paper Testing Committee. The problem of testing for water-vapor permeability is under intensive study by the Commtitee and a further revision of the standard is expected.

Manpower Lack Affects Reforestation

The manpower shortage has also affected the reforestation program carried on in the state by the Wisconsin Conservation Committee. C. L. Harrington, state superintendent of forests and parks, declares that it is unlikely that more than 15,000,000 trees will be planted this year on state-owned lands, against 25,000,000 last year and a normal average of 40,000,000. The situation is such that the program may have to be suspended entirely by next spring, he said. County-planted forests also are suffering because county boards are reluctant to divert manpower from farming. One of the largest planters, Marinette

Study of Dyestuff Absorption by Fillers and Their Effect upon the Color of Filled Papers*

By Otto Kress[1] and Peter Trucano[2]

Abstract

Primary clays have better dye absorptive properties than any secondary clay studied; this is probably due to the constituent groups or impurities present. Particle size is not an important factor in determining the adsorption of acid—or basic-dyestuff absorption but it does have an effect upon the adsorption of direct dyes. Inert fillers (zinc oxide, zinc sulphide, etc.) completely adsorb direct dyes but have little or no affinity for acid or basic dyes at the concentration of dye studied. Diatomaceous earths or silicas have an affinity for basic dyes but not for acid dyes; amorphous silicas have a greater adsorptive power than the crystalline type. A study of the spectral adsorption curves of various types of dyeings indicates that the mechanism of dyestuff adsorption is one involving clay-water-dye orientation or linkage; such a mechanism is outlined and discussed. The order of addition of the various components is an important factor in the final color of the sheet. As a result of the present work, it is concluded that there are certain optimum conditions for dyeing a filled sheet to obtain a maximum depth of color. They are as follows: (1) A clay with minimum adsorptive properties should be used as the filler. (2) The dye should be added to fibers first and mixed thoroughly. This mixing should be followed by addition of clay and size. To produce the deepest dyeing, the clay should be in the slurry as short a time as possible, because it has a tendency to deprive the fiber of its color. The alum is added just previous to sheet formation. On certain mixed furnishes, such as groundwood and unbleached chemical pulps, this method of dyeing will tend to increase mottling of the finished sheet. (3) If conditions require a color-lake dyeing, the dyeing should be effected in the presence of the rosin size because this produces a deeper dyeing.

The colloidal nature and behavior of clay fillers in reference to papermaking problems have received only recently proper consideration. Little work has been done on the effect of these fillers on the color of the finished paper, and especially on the mechanism of absorption or reaction of the commonly used papermaker's dyes with fillers. By the use of the General Electric recording spectrophotometer reflection curves, and the application of optical formulas and other techniques of recent development, it is hoped that some light can be thrown upon the interaction of clay and dyestuffs and the color of the dyed filled sheets.

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* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 15-18, 1943.

A portion of a thesis submitted by the junior author in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Master of Science from Lawrence College, Appleton, Wis., May, 1942.

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Historical Review

Ström *(1)* studied the adsorption of representative acid, basic, and substantive dyestuffs on some of the common fillers and determined colorimetrically the amount of adsorption. von Possanner *(2)* enlarged upon Ström's work and drew similar conclusions. His adsorption curves, however, were very irregular.

Mottling effects of basic dyes on unbleached sulphite-groundwood mixtures have been observed because chemical pulp has a greater affinity for basic dyes than does mechanical pulp *(3)*. It was suggested that basic dyes might be precipitated on china clay to form a clay-dyestuff pigment which would readily dissociate in the presence of water in the beater as a method for minimizing such effects.

A color problem arising out of the use of fillers was discussed by Roberts *(4)*. He considered two-sidedness as the greatest problem in the coloring of filled paper and stated that, by mixing clay and dye together and adding it to the beater, two-sidedness of paper was eliminated.

Friedman and Kuykendall *(5)* studied the effect of pH upon the adsorption of dyes by cellulose and fillers.

Rohland was the first to study the colloidal adsorptive properties of clays. Rohland's first paper *(6)*, which antedates the work of Ström and von Possanner, stated that substances which contained oxygen (such as water, ethyl alcohol, and acetone) are adsorbed by the "colloidal hydroxides" in clays, whereas those that do not contain oxygen are not adsorbed. However, he stated that there were exceptions. He *(7)* later stated that adsorption of dyestuffs was due to colloidal particles of silicon, aluminum, ferric and other hydroxides which are formed when clay is added to water. Because the dyestuffs adsorbed usually have high molecular weights *(8)*, he suggested that there might be some relation between their chemical structure and their adsorption by colloidal vehicles. Later Rohland *(9)* stated that adsorption was not dependent on the size of dye molecule or its chemical nature, but on the colloidal or crystal condition of the slurry. In another article *(10)*, he even suggested that dyestuff adsorption depends on the amount of nitrogen present in the dyestuff. Those dyes having little or no nitrogen are readily adsorbed, whereas those which contain considerable nitrogen are very slightly adsorbed. In his last article *(11)*, Rohland again stated that adsorption was proportional to the amount of colloidal material present.

Ungerer *(12)* concluded that adsorption of basic dyes by clay colloids conforms to the general adsorption isotherm. Bonnell *(13)* stated that the size of the particles has a negligible effect on adsorption of acid and basic dyestuffs. Kondo's experiments *(14)* revealed that dyestuff adsorption was not in accord with Freundlich's formula.

Testoni *(14)* carried out experiments with the ulti-

mate object of determining the relation between chemical constitution and adsorption by basic, acid, and neutral inorganic adsorbents. He found that *(a)* silica adsorbed basic dyes, and that *(b)* aluminum hydroxide adsorbed acid dyes; there was no relation between the adsorbing power of neutral kaolin and the chemical nature of the dye.

Fodor and Riwlin *(16)* made an interesting study of dye adsorption using an optical method. In order to determine the mechanism of dye adsorption, they studied the transmissive power at different wavelengths of light of a dyestuff in the presence and absence of a dispersoid.

Other articles on dye adsorption by clays appear in the literature but the conclusions drawn are not definite and are similar to those discussed above.

Materials Used and Experimental Procedures

Clays

Three commercial clays were used in most of this work; they may be characterized as follows:

Clay A—A domestic primary clay.
Clay B—A secondary clay used as a filler.
Clay C—A secondary coating clay which is also used as a filler clay.

Other clays are described under the experiments in which they were used.

Preparation of Handsheets

Three types of dyeings were made.

Type 1—No filler. A 3-gram finished sheet was made, the order of addition of the ingredients being pulp, dye, size, and alum. The pulp used was an unbleached Mitscherlich sulphite beaten to produce a suitable stock. The beaten pulp was pressed and stored so that all dyed sheets were made from the same lot of pulp. The sheets were made according to the method of Laughlin and Kress *(17)*, as modified by Howells *(18)*, using a 8¼ by 8¼-inch sheet mold.

Type 2—Clay-pulp dyeing. The order of addition of the ingredients was pulp, clay, dye, size, and alum; the clay in the form of a slurry was mixed with the pulp just before the dyestuff addition.

Type 3—Dyed clay or pigment dyeing. The order of addition was pulp, dyed clay, size, and alum. The dyestuff was added to a 50-ml. dispersion of the clay and was allowed to stand for at least one hour. During this time the dyestuff was adsorbed by the clay; practically complete adsorption in the proportions used occurred almost instantly. This slurry of dye-clay-water was then added to the pulp slurry.

Method for Determining Depth of Color in Handsheets

The General Electric recording spectrophotometer was used. The sheets were folded once with the wire side exposed and reflection curves made with magnesium carbonate as a standard. The difference in reflectance between dyed and undyed sheets at the wavelength of maximum absorption was used as an approximate measure of the depth of color in the sheet.

Determination of Color in the Wet and Dry Colored Clay Pigments

A small amount of the moist dyed clay was spread on a piece of dry filter paper which dewatered it further; a sheet of transparent Ethocel was then pressed over this area so that the clay pigment formed a uniform layer between the Ethocel and the filter paper. The prepared sample was placed in the window of the recording spectrophotometer and the color curve determined. A sheet of Ethocel was inserted in the magnesium carbonate window to compensate for the added reflectance of the Ethocel in front of the pigment.

In measuring the color of the air-dried pigment, it was packed in a weighing bottle cover (ground so that its depth was approximately ⅛ of an inch), leveled off, and covered with a sheet of Ethocel.

Characterization of Clays Used

X-ray Diffraction Pattern Interpretations

Through the courtesy of G. L. Clark of the University of Illinois, X-ray diffraction patterns were made of the clays; he interpreted the patterns as follows:

Clay A is definitely of the kaolinite type and shows a distinctly colloidal character, because the diffraction lines are markedly broadened. There is also a small amount of silica present.

Clay B shows the predominating presence of kaolin but with particles definitely larger than 10^{-6} cm. as indicated by the sharp diffraction lines in the pattern. An additional component has been identified as cristobalite (a crystalline form of silica), which has practically the same particle size as Clay B.

The principal difference between the two clays was particle size, which caused one to be colloidal in character, whereas the other was more crystalline.

Clay C was interpreted by Dr. Clark as a true kaolinite.

Electron Micrographs

The original purpose in using the electron microscope was to determine whether a high molecular weight dye, adsorbed or oriented on the clay, could be identified at a magnification of approximately 17,500. Because Sears and Kregel *(19)* were able to observe pigment dyes oriented on cellulose fibers, it was considered that the dyestuff molecules might likewise be oriented on the clay surface. A study of the electron micrographs, however, did not show this to be the case. The micrographs are interesting, however, because they bring out particle size and structural differences of the clay.

Determination of Degree of Hydration

The laboratory procedure followed was that of measuring the sedimentation volumes of the clays according to Comber's method *(20)*. These results indicate that Clay A had a slightly greater degree of hydration than Clay B.

Determination of Particle Size by Sedimentation Analysis

The procedure followed was that used by McCarron *(21)*, utilizing the sedimentation balance. The data reveal that Clay B had a much larger particle size than Clay A, which is in agreement with X-ray analysis and electron micrographs.

Experimental Data and Results

Dyestuff Adsorption of Various Clays

A study of dyestuff adsorption was made to determine whether there were differences in adsorptive powers of the common clays used in papermaking. Thirteen clays were used in this survey.

The criterion for adsorption was colorimetric observation of the filtrate after the clay was filtered from the dyed slurry. Reflection curves, which

brought out any color difference, were made on the air-dried pigments. These curves are presented in Fig. 1.

The test was carried out by dispersing 5 grams of clay in 15 ml. of distilled water and adding 12 ml. of Victoria green (1 gram in 500 ml. water). This mixture was thoroughly stirred and allowed to stand for one hour. The slurry was then filtered and colorimetric observation made on the filtrate. The dyed-clay residue was spread on a watch glass and allowed to air dry. The results are given in Table I.

TABLE I.—ADSORPTION OF DYE BY CLAYS

Clay	Adsorptive Property
D	Excellent
Acid-washed D	Excellent
A	Good
Acid-washed E	Good
C	Average
E	Average
F	Average
G	Average
H	Poor
I	Poor
Acid-washed C	Poor
J	Very poor
B	Very poor

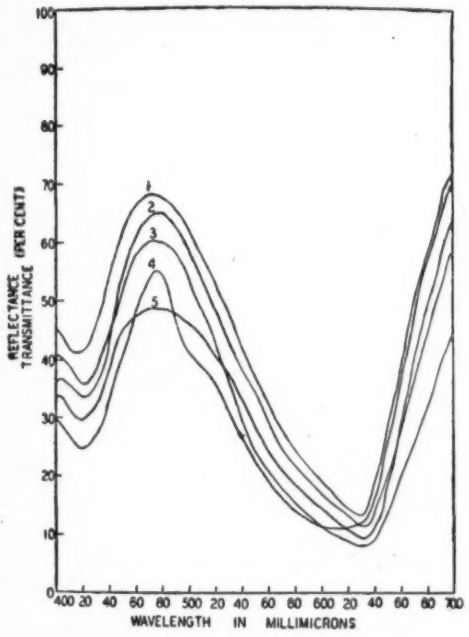


FIG. 1
Reflection Curves of Dried Victoria Green Pigments—Curves 1-5 Are for Clays I, C, A, B, and D, Respectively

pH STUDY AS A MEANS OF EVALUATING THE MECHANISM OF BASIC DYE ADSORPTION BY CLAYS

A study of pH values of basic dyestuff solutions, clay slurries, and mixtures of the two was made, using a glass electrode, to determine if these measurements would provide a means of evaluating the mechanism of the reaction.

Clay A (primary) and Clay E (secondary) were used. Forty ml. of clay slurry (200 grams clay in a liter of water) were pipetted into a beaker, 20 ml. of dyestuff (0.5 gram in 250 ml. water) added, and the two mixed thoroughly; this was equivalent to 0.5% of dye on the weight of the clay. pH values were determined for this mixture, and also for the dyestuff, the clay slurry, and the distilled water. The results are given in Table II.

TABLE II.—pH VALUES OF THE VARIOUS SLURRIES

Dyestuff	pH Values: Dye Solution	Dye plus Clay A	Dye plus Clay E
Auramine conc.	5.35	5.80	4.85
Chrysodine GN	3.97	5.80	4.74
Safranine T extra	5.60	5.85	4.90
Rhodamine B	3.25	5.90	4.70
Victoria green SC	2.80	5.28	3.46
Methyl violet NE	4.05	5.90	4.90
Victoria blue BO	3.12	5.85	4.28
Methylene blue ZX	4.95	5.65	4.68

pH of Distilled water 5.55
pH of Clay A slurry 6.15
pH of Clay E slurry 5.00

Clay A always gave a deeper colored pigment than did Clay E.

This method cannot be used as a means of evaluating the mechanism, because the results did not indicate whether a chemical reaction or a neutralization of two solutions of varying hydrogen-ion concentration had occurred.

COMPARATIVE TESTS OF DYESTUFF ADSORPTION OF REPRESENTATIVE CLAY FILLERS AND OTHER PAPERMAKER'S FILLERS

In this test three representative dyestuffs were used: Safranine T extra—basic dyestuff, Crocein scarlet N extra—acid dyestuff, and Fast scarlet 4BS—direct dyestuff.

The tests were carried out as follows: 6 grams of filler were dispersed in 50 ml. of water and 6 ml. of dyestuff (0.5 gram per liter of water) were added, thoroughly mixed, and allowed to stand for two hours. The mixtures were then filtered and colorimetric observations were made of the residues and the filtrates. The resulting pigments were washed with 25 ml. of water and refiltered in order to determine whether they were stable. The results are tabulated in Table III.

TABLE III.—COMPARATIVE ADSORPTION TESTS OF REPRESENTATIVE CLAY FILLERS AND OTHER PAPERMAKER'S FILLERS

Fillers	Safranine T extra		Crocein Scarlet N extra		After Washings: Safranine T extra		Crocein Scarlet N extra	
	Filler	Filtrate	Filler	Filtrate	Filler	Filtrate	Filler	Filtrate
Clay A	bright	clear	colored	clear	no change	clear	no change	clear
Clay B	dull	clear	light	colored	no change	clear	slight tint	colored
Calcium Carbonate	slight pink	colored	light	colored	light pink	colored	slight color	colored
Zinc Oxide	very faint	colored	light pink	colored	no color	colored	slight color	colored
Crown Filler	light	colored	light pink	colored	light	colored	light color	colored
Zinc Sulphide	no color	highly colored	no color	highly colored	practically white	colored	nearly white	colored
Silocel	dull	colored	light violet	clear	still colored	colored	no change	clear
Barium Sulphate	light	colored	light pink	colored	light pink	colored	dark pink	colored
Talc	bright	clear	bright	clear	no change	clear	no change	clear

In the case of Fast scarlet all filtrates were clear; in other words, this direct dye was completely adsorbed by all the common fillers used. None of the direct dye could be removed by washing.

Colorimetric observations on the color of the filler after direct dye adsorption were as follows:

Clay A	Brightest
Talc	Bright
Barium Sulphate	Bright
Crown Filler	Bright
Clay B	
Calcium Carbonate	
Zinc Oxide	
Silocel	
Zinc Sulphide	decreasing order of color and brightness

Adsorption of Diatomaceous Earths and Silocel

Because Silocel displayed peculiar adsorptive qualities in the previous experiment, tests were carried out using Celites and other diatomaceous earths to determine whether the behavior of the Silocel was characteristic of all diatomaceous earths. The procedure followed was the same as that used in the previous experiment. Safranine and Crocein scarlet were the representative dyestuffs used. The following results were obtained:

(1) The basic dye was completely adsorbed by Dicalite C.U. and Johns-Manville Celites 10249, 10246, and 10250.
(2) Celite 263 adsorbed practically all the basic dye.
(3) Velvetin R Silica (300 mesh), and Celite 10247 adsorbed a large portion of the basic dye.
(4) Crystalline silica (140 mesh) adsorbed only a small amount of the basic dye.

From the above results it was concluded that diatomaceous earths have an affinity for basic dyes, but not for acid dyes. The amorphous silicas had greater adsorptive powers than the crystalline type.

Particle Size and Its Influence on Adsorption of Dyestuffs

Because Clay A, which had a smaller particle size, possessed greater adsorptive power than Clay B, the following experiment was carried out to determine whether particle size was a factor in dyestuff adsorption by clays. In order to decrease the particle size of Clay B, a sample (100 grams per liter of water) was run through a colloid mill for approximately five minutes. The decrease in particle size was noted by electron microscope photographs taken at a magnification of 17,500 and by sedimentation curves. The results of the dyestuff adsorption of this milled clay, as compared with the original clay, appear in Table IV.

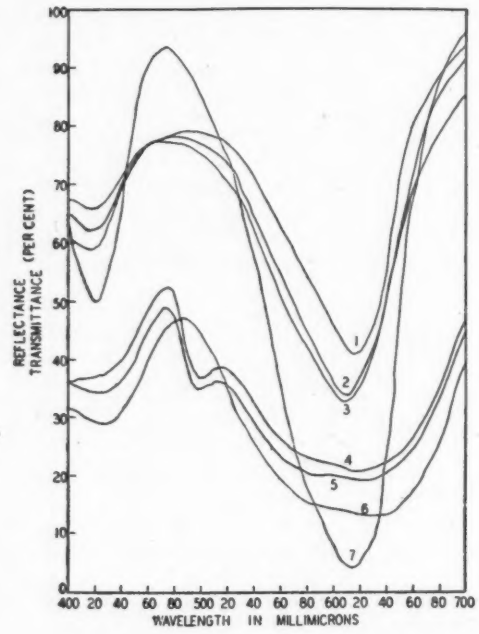


Fig. 2

Victoria Green—Curves 1-3 Are for Dry Pigments of Clays C, A, and B; 4-6, Moist Pigments of Clays C, B, and A; and 7, Dyestuff Solution Alone

TABLE IV.—INFLUENCE OF PARTICLE SIZE ON DYESTUFF ADSORPTION

Filler	Dyestuff: Victoria green (basic dye)	Crocein scarlet N extra (acid dye)	Sky blue 6 BX (direct dye)
Clay B	practically complete adsorption	slight adsorption	slight adsorption
Colloid-Milled Clay B	practically complete adsorption	slight adsorption	complete adsorption

Within experimental accuracy and visual observation, it can be concluded that particle size of the clay has no effect on basic and acid dye adsorption; however, it has a definite effect on direct dye adsorption.

Optical Method as a Means of Studying Dyestuff Adsorption by Clays

It was hoped that a study of reflection or color curves would give some indication of the reaction mechanism of dye adsorption by clays. In this study, reflection curves were made on the dyestuff alone (0.015 gram per liter of water), on the moist pigment formed after addition of the dye solution to the clay, and on the air-dry pigment. Eight representative dyes (basic, acid, and direct) were used with Clays A, B, and C. The pigments were produced by adding 6 ml. of dyestuff (0.5 gram per liter of water) to a slurry containing 6 grams of clay. The reflection curves of one of the dyestuffs—Victoria green—appears in Fig. 2.

Some of the peculiarities of the curves are:

(1) Color curves of the pigments from Clays B and C (secondary clays) tended to take the same characteristic shape, whereas those from Clay A (primary clay) were different.
(2) Pigments from Clay A had greater depth of color than those from Clays B and C.
(3) In comparing curves of the dyestuff alone with those of the moist pigments, a shift of the wavelength of maximum absorption was observed.
(4) In some cases additional maxima were introduced in the curves, indicating that new chromatophoric groups were present which had changed the color of that dyestuff.
(5) In the case of the basic dyes, a very pronounced maximum was apparent with the moist pigment curves at approximately 500 mμ. This was lost upon drying but reappeared after rewetting.
(6) Clay A maxima did not correspond with those of Clays B and C, whereas the maxima of Clays B and C were the same.

Effect of Calcining on Dye Adsorption

Adsorption tests were carried out on the calcined and uncalcined clays. The former were prepared by heating samples in a muffled furnace at 650° C. for two hours. The results are shown in Table V.

TABLE V.—EFFECT OF CALCINING ON DYE ADSORPTION

Fillers	Dyestuffs: Victoria green (basic dye)	Crocein scarlet (acid dye)	Sky blue (direct dye)
Clay A	complete adsorption	complete adsorption	complete adsorption
Calcined A	slight adsorption	slight adsorption	complete adsorption
Clay B	complete adsorption	slight adsorption	partial adsorption
Calcined B	complete adsorption	no adsorption	no adsorption

The results (as observed from the color curves) indicate that calcining had no effect on the adsorptive property of Clay B. The mechanism must be different, however, because the calcined clay gave a green pigment, whereas the original clay gave a blue one.

Calcining greatly affected the adsorptive properties of Clay A for the basic and acid dyes but did not appreciably affect its adsorption of the direct dye.

The fines of the calcined clays were heavily colored, whereas the coarser particles were only lightly colored.

Effect of Lime and Caustic Treatment on Dye Adsorption

These experiments were carried out with Clay C (an acid-washed clay). The lime- and caustic-washed clays were prepared by Brown *(22)*. The results are given in Table VI.

TABLE VI.—EFFECT OF LIME AND CAUSTIC WASHINGS ON DYE ADSORPTION

Filler	pH of slurry	Dyestuff Adsorption		
		Victoria green	Crocein scarlet	Sky blue
Acid-washed	4.35	approx. complete	slight	complete
Lime-washed	6.80	approx. complete	slight	partial
Caustic-washed ...	8.85	complete	slight	slight

It may be stated that acid dye adsorption was not affected by the caustic or lime washing. The direct dye had the greatest affinity for the acid-washed clay and least for the caustic-washed clay.

Effect of Clay Fillers and of Type of Dyeing on Color of Paper

A study of the effect of fillers and of the order of addition of the filler and dye on the color of the finished sheet was made with sheets of Types 1, 2, and 3, using 13 representative dyes and Clays A and B. The following observations were made.

(1) Clays A and B had different effects on the final color of the paper; when Clay B was the filler, the sheet was always more highly colored.

(2) At the same dye concentration, the clay-filled sheet was less colored than the unfilled sheet.

(3) Type 2 sheets always gave a greater depth in color than Type 3. This difference was more pronounced for the basic and direct than for the acid dyes.

The maximum absorption values of the various sheets are given in Table VII; the depth of color of the sheet is proportional to the maximum absorption value at the wavelength of maximum absorption. Reflection curves of standard Safranine T extra dyeings were prepared to obtain the relationship between color difference and absorption values; these results are given in Table VIII.

Investigation of Color of Separated Fibers and Clay

Because the above results indicated that differences exist due to the order of addition in the dyeing operation, it was of interest to investigate the color of the fibers and of the dyed clay particles that composed the sheet. The experiment was carried out using Victoria green and Safranine T extra dyestuffs and Clays A and B.

TABLE VIII.—RELATIONSHIP OF ABSORPTION VALUE* AND DYE CONCENTRATION

Safranine T extra

Type of Dyeing lb.	Absorption Value at 540 mμ**—%
0	35.0
1/6	56.0
1/3	64.5
1/2	70.0
2/3	72.5
5/6	75.5
1	78.0

* Value obtained by subtracting the reflectance value at wavelength of maximum absorption from 100%.
** Wavelengths where absorption was greatest.

The dyeing was carried out as previously described, except that no size or alum was added. Instead of making a handsheet from the slurry, a separation of the fibers and clay particles was carried out by centrifuging through a 65-mesh screen in a basket centrifuge. A sheet was made on a Büchner funnel of the fibers remaining in the basket. The clay particles in the filtrate were allowed to settle, separated, and air dried. The results from the color curves indicated that the fibers of Type 2 were more highly colored than those of Type 3, and that pigments of Type 2 were less colored than those of Type 3. More dye was readsorbed from Clay B than from Clay A, which accounts for the large color variations existing in the final sheets.

Effect of Varying the Amount of Clay Filler Added

Sheets were made in which the amount of clay was varied from 0.7 to 6.0 grams, based on a 3-gram pulp sample. The percentage of clay in the finished sheet was calculated from the ash content. The ratios of absorption to scattering coefficient *(k/s)* were obtained from the reflectance measurements and scattering coefficient-reflectance tables. *SX*, the scattering power values, were obtained from a reflectance-opacity Judd chart *(23)*. The results are tabulated in Table IX.

The depth of color was inversely proportional to the amount of clay present in the sheet—that is, the greater the clay content of the sheet, the less the depth of color in the sheet. By comparing the reflection curves and maximum absorption values with the values for standard Safranine T extra (Table VIII), it was found that the depth of color varied between 1/6 to 1-pound dyeing, indicating that in some cases approximately 80% of the tinctorial power of the dye was lost.

Clay A always produced sheets which were lighter in color than Clay B. Type 3 dyeings using Clay A gave higher scattering coefficient values at the same clay content than those of Type 2.

TABLE VII.—ABSORPTION VALUES OF THE VARIOUS TYPES OF SHEETS MADE

Type of sheet	Basic Dyestuffs					Acid Dyestuffs				Direct Dyestuffs			
	Safranine T extra at 540 mμ	Methyl violet at 585 mμ	Victoria green at 624 mμ	Auramine at 450 mμ	Fuchsine conc. at 560 mμ	Methanil yellow at 420 mμ	Orange RO at 500 mμ	Nigrosine at 580 mμ	Crocein scarlet at 520 mμ	Brilliant paper yellow at 420 mμ	Fast scarlet at 520 mμ	Sky blue at 640 mμ	Paper black at 610 mμ
Type 1	77.5	83.0	85.0	74.5	86.0	60.0	62.0	51.0	57.0	77.5	71.0	67.0	74.0
Type 2—Clay B.....	59.0	71.0	75.0	61.0	73.5	45.0	42.5	34.5	35.0	65.5	53.0	49.0	55.5
Type 3—Clay B.....	52.5	65.0	72.5	59.5	65.0	45.0	41.0	31.0	35.0	65.0	38.0	42.5	43.0
Type 2—Clay A.....	49.0	62.0	66.0	53.0	65.0	43.0	39.5	29.5	35.0	60.0	42.5	34.5	42.0
Type 3—Clay A.....	43.0	51.5	62.0	51.0	54.0	42.0	38.5	28.0	35.0	59.5	36.0	22.5	40.0

TABLE IX.—EFFECT OF VARYING THE AMOUNT OF CLAY ADDED

Sheets	Basis Weight (17x22—500)	k/s	SX	SX*	Clay in Sheet %
Type 1	17.4	1.335	1.90	2.23	0.0
Type 2—6g. A	22.3	0.235	3.65	3.28	16.4
Type 3—6g. A	21.3	0.157	3.80	3.56	16.2
Type 2—6g. B	22.0	0.417	4.20	3.82	16.7
Type 3—6g. B	22.2	0.290	4.00	3.60	17.7
Type 2—3g. A	21.4	0.326	3.80	3.54	14.3
Type 3—3g. A	21.0	0.250	4.10	3.90	14.6
Type 2—3g. B	19.3	0.586	3.75	3.68	11.7
Type 3—3g. B	21.2	0.463	3.95	3.72	12.0
Type 2—1.5g. A	19.6	0.477	3.20	3.26	8.7
Type 3—1.5g. A	20.2	0.412	3.50	3.50	8.0
Type 2—1.5g. B	18.7	0.806	2.95	3.15	6.1
Type 3—1.5g. B	19.9	0.680	3.10	3.10	7.0
Type 2—0.7g. A	18.7	0.701	2.65	2.83	6.7
Type 3—0.7g. A	19.1	0.641	2.66	2.78	6.0
Type 2—0.7g. B	19.5	0.925	2.40	2.46	4.0
Type 3—0.7g. B	18.7	0.869	2.55	2.72	4.2

* *SX* is calculated on a 20-pound basis weight.

Effect of Changing the Order of Addition of the Various Ingredients on the Color of Paper Using Safranine T Extra, Sky Blue 6 Bx, and Crocein Scarlet N Extra

Sheets in this experiment were made up with six grams of clay as filler and three grams of fiber. Clays A and B were used with three representative dyes. All sheets contained the same ingredients but the order of addition was varied. The sheets were made as follows:

(a) Pulp, clay, dye, size, alum (Type 2 dyeing)
(b) Pulp + dye (mixed 10 minutes), clay, size, alum
(c) Pulp, size, clay, dye, alum
(d) Pulp, alum, clay, dye, size
(e) Pulp, size, dyed clay, alum
(f) Pulp, alum, dyed clay, size

The following results were obtained from a study of the color curves:

(1) In all cases, dyeings using the order of addition indicated in *b* gave a deeper dyeing than any of the others; the order in *f* gave the lightest dyeing.

(2) When size was added before the alum, a deeper dyeing resulted than when alum was added first.

(3) These effects were quite marked for basic and direct dyes, whereas for acid dyes, they were hardly apparent, probably because the dye retention was less.

Discussion

Experimental work has confirmed the fact that the fillers used in the paper industry have varying adsorptive properties toward dyestuffs. The primary clays had a greater adsorptive capacity than the secondary clays. Detailed chemical analyses of these clays were not performed; however, from X-ray analysis it was found that the representative clays used were all kaolinites of the general formula $Al_2O_3.2SiO_2.2H_2O$. In the acid extract from Clay A, Fries *(24)* found considerably more iron and aluminum than in that from Clay E; this aluminum and iron may be an impurity in the clay or an exchangeable cation in the double layer of the clay particle. He also determined the reciprocal alum number of these clays and found that Clay E had a higher number than Clay A, which indicated that Clay E had a greater electrostatic charge. If this is true, then the charge on the particle is not the determining factor of adsorption, because Clay A, which has a lower charge, adsorbed more dyestuff than Clay E. This indicated that the mechanism involved was more than a mere neutralization of colloidally charged particles.

Since Clay A contained more loosely combined aluminum and iron, this could be considered as an influential factor in adsorption. The aluminum and iron may form hydroxides in the water dispersion and thereby adsorb more dyestuff than clay which did not possess these impurities. With the data available, the reason for the difference in adsorptive power cannot be definitely stated; however, it can be said that primary clays adsorb dyestuff to a greater extent than secondary clays.

At the dyestuff concentration used, Clay A displayed a peculiar adsorptive property in that it adsorbed acid, basic, and direct dyes completely. This amphoteric property of the clay may be the result of its crystal lattice structure, which is probably composed of alternate sheets of alumina and silica. Because alumina has affinity for acid dyes and silica an affinity for basic dyes, it is possible that, in the case of Clay A, the adsorption of acid dye occurred on the alumina plate, whereas the adsorption of the basic dye occurred at the silica plate surface.

Because Clay A, which was of smaller particle size, has greater adsorptive power than Clay B, it seems that particle size is a factor in dyestuff adsorption by clays. In this investigation it was found that, although particle size had no influence on basic and acid dye adsorption, direct dyes were adsorbed to a greater extent on the smaller particles, indicating that direct dye adsorption is related to particle size—that is, to specific surface.

Although the particle size was reduced in the colloid mill, the shape of the particles was still that of the hexagonal crystal type. It is quite probable that milling does not disintegrate the particles to such an extent that they will take on the shape of Clay A particles. Sheets *(25)* found that the particle sizes of Clays D and B were approximately the same. Since Clay D, which is a primary clay, adsorbed dyes to a greater extent than Clay B, this is also an indication that particle size is not the important factor in dyestuff adsorption by clays.

Since particle size and charge had no marked effect on acid and basic dyestuff adsorption, it is quite probable that some other mechanism of reaction is involved in this case. Since Clay A adsorbed all three dyestuffs and Clay B only appreciably adsorbed two, the difference must lie in the impurities present, in the clay structure, or in the dye molecule.

Electron micrographs bring out structural and particle size differences of clays quite readily at a magnification of 17,500X, but do not show any orientation of dyestuff on the clay particle.

A study of the mechanism by the optical method produced some interesting data. It was noticed that Clays C and B, which were structurally similar, had similar reflection curves—that is, maximum absorption values occurred at the same wavelength. The reflection curves of the moist pigments from the basic dye and Clays B and C showed a new maximum between 460 and 500 mμ the effect being more pronounced in the case of Victoria green and Methyl violet. This new maximum value indicated that a drastic change had occurred in the dye molecule, either from a chemical reaction or because of the orientation of the dye on the clay surface. This new maximum was probably caused by the formation of a new bond in the dyestuff structure, whose resonating action may absorb energy at this frequency. In other words, a new chromatophoric group has been introduced into the dye molecule.

Of interest at this point is the work of Allen, Wilson, and Frame *(26)* on the relationship between absorption spectra and constitution of certain acid anthraquinone dyes. They found that maximum absorption varies with the type of dye structure and that any group introduced into this structure shifts the maxima and gives the color curves a different characteristic shape. The new maxima are caused by the introduction of a new type of bond, which has a

different resonating action. This seems to be analogous to the case of dye adsorption by clays.

Using Methyl violet and Victoria green dyestuffs as examples, it is seen that the clay-dyestuff moist pigments have reflection curves with similar secondary maxima. Since these two dyestuffs are similar in molecular structure, it is reasonable to expect that any reaction of these dyes with the same or two very similar compounds (e. g., clays) should give reflection curves with similar characteristics. The results showed that the reflection curves of Methyl violet and Victoria green pigments using Clays B and C were similar.

Since the air-dry pigments of Clays B and C with Methyl violet and Victoria green did not show the new maxima, some change in structure had occurred, and the shape of the reflection curve had the characteristics of the original dyestuff curve. Upon rewetting the pigments the secondary maxima were again observed indicating that water must be present to give the double maximum absorption curve of the moist pigment. It therefore appears that the mechanism of dye adsorption by clay is one of a linkage of water-dye-clay. Since calcined clay did not give the new secondary maximum, it is again indicated that water is an essential constituent in the constitution of the wet pigment. From these results, the mechanism of dyestuff adsorption by clays might be that indicated in Figs. 3 and 4.

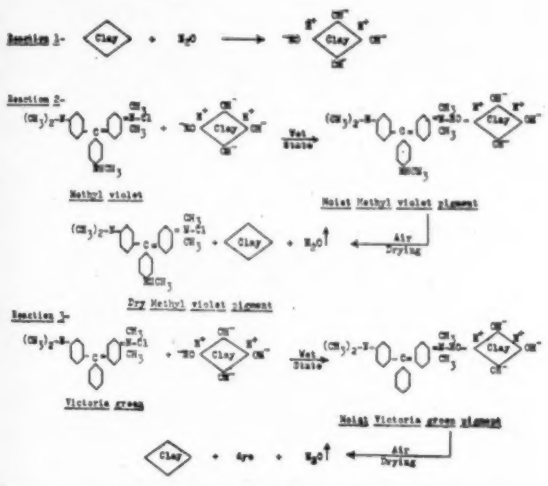


FIG. 3
Diagram of Dyeing Mechanism for Methyl Violet and Victoria Green

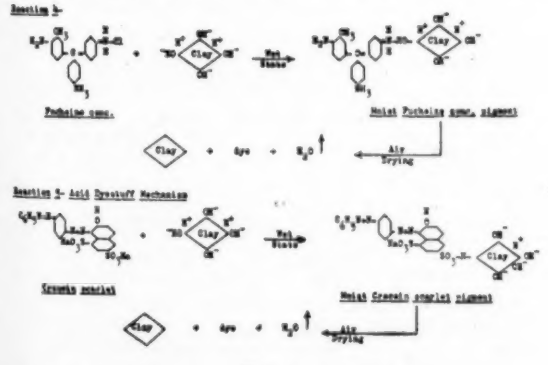


FIG. 4
Diagram of Dyeing Mechanism for Fuchsine and Crocein Scarlet

These reactions may be considered a hypothesis of the mechanism of dyestuff adsorption by clays. Reaction 1 indicates a colloidal dispersion of the clay; it acquires an overall negative charge by preferentially adsorbing hydroxyl ions from the slurry. Reaction 2 shows the formation of the moist Methyl violet pigment from the reaction of clay, water, and dyestuff. The resulting pigment has a new bond linkage.

$$(= \overset{\displaystyle CH_3}{\underset{\displaystyle CH_3}{N}}\!-\!OH\!-\!clay)$$

in its structure instead of the

$$(= \overset{\displaystyle CH_3}{\underset{\displaystyle CH_3}{N}}\!-\!Cl)$$

original linkage of the dyestuff. The resonating action of these two linkages will be different and therefore will give curves of different characteristics as shown in the experimental work. Upon air drying the pigment, the water is evaporated from the surface of the clay particles, causing a shift in the equilibrium reaction. A compound is formed similar to the original dyestuff, which is deposited on the clay surface. The dry pigment will give a reflection curve characteristic of the original dyestuff.

In Reaction 3 Victoria green, which is structurally similar to Methyl violet, is used. The resulting pigment has the same type of linkage as in the case of Methyl violet and, therefore, should give a reflection curve similar to that of the Methyl violet pigment. In Reaction 4 a basic dye—viz., Fuchsine—of different structure is used to give a different type of linkage

$$(= \overset{\displaystyle H}{\underset{\displaystyle H}{N}}\!-\!OH\!-\!clay),$$

which should possess characteristics different from the type in Reaction 2. This assumption is true, because the reflection curve for this pigment is different from the Methyl violet pigment curve. The above discussed reactions indicate that the structure of the dyestuff is an influential factor in determining the property of the resulting pigment.

The clay structure, however, is also an important factor in this reaction. When Clay A was used, the linkage between the dye and clay was the same but the resonating effects were probably different. In all cases, the resulting pigment has a greater depth of color. Again, this can be a property of the linkage involved. The structure of the clay, therefore, is a determining factor in the reaction and reaction products.

These results are similar to those obtained by Allen, Wilson, and Frame *(26)*. They found that a new linkage or group changed the absorption curve characteristic. This is analogous to the dye adsorption by clays, for the addition of the clay changes the reflection curve characteristics of the dyestuff.

The formation of a new linkage in the presence of water may be called a chemical reaction or chemical adsorption, depending on the definition of the terms. It will be considered as a chemical adsorption because colloiday clay particles are involved. The adsorption does not involve a single dye molecule on the surface of the clay particles. As many new linkages between dye and clay will be obtained as there are hydroxyl groups. This reaction is irreversible.

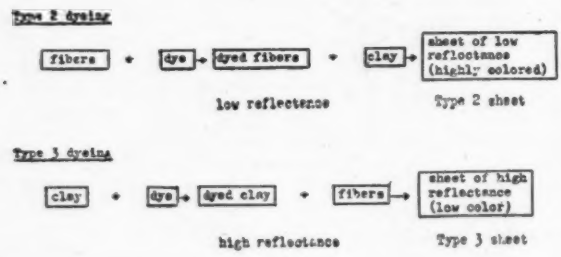
In the case of an acid dye a similar explanation is offered and Reaction 5 indicates the mechanism. Since clays possess an overall negative charge, there is no reason to eliminate the possibility of some positive anions (such as hydrogen ions from the water) also being adsorbed on the surface. The number of anions present on the surface may well determine the amount of acid dye that the clay will absorb. Since Clay A adsorbed more acid dye than Clay B, it probably has more of these anions on its surface.

Sheppard, Lambert, and Walker *(27)* discussed the optical sensitizing of silver halides by dyes and their adsorptive properties. They assumed that water entered into the constitution of the pigment from the dye-coated halide. Their results indicate that the process of dye adsorption by halides is somewhat analogous to dye adsorption by clays. It appears that the hypothesis for dye-clay adsorption is in agreement with their results.

The pigments made from lime-washed clay using Victoria green dyestuff did not possess a maximum adsorption value at 500 mμ, but the pigments made from caustic- and acid-washed clays did possess a definite maximum at this point. The probable reason is that a lime-washed clay contains calcium ions in its lyosphere and resists colloidal dispersion. If the clay was not colloidally dispersed and preferentially adsorbed hydroxyl ions, then the same mechanism cannot take place.

This investigation shows that the filler has a definite effect on the color of the finished sheet. The filler with the greatest adsorptive power for the dyestuff lowers the color to a greater extent than one with a low-dye adsorbing power. This difference is primarily due to the affinity of the clay and fiber for the dyestuff. If the clay had a larger adsorptive capacity or greater affinity than the fibers for the dyestuff, it would preferentially adsorb the dye. This would result in a lighter dyeing because the clay has acquired most of the tinctorial power of the dye and the fibers are not highly colored. These color effects are more pronounced in the case of basic and direct than in the case of acid dyes. This is probably because acid dyes are not retained to any extent and, therefore, less color is present in the sheet. From the above results, it can be concluded that a clay with minimum adsorptive properties should be used as the filler in clay-filled paper. Inert fillers which do not adsorb the dyestuff would be the best fillers to use if they had the necessary filler characteristics.

The order of addition of the clay and dyestuff has a marked effect on the color of the finished paper. This effect is more pronounced when the clay content in the sheet is high. The same trend existed with all the types of dyestuffs. Type 3 dyeings were always less colored than Type 2 dyeings. In order to account for these differences the following explanation is offered:



There also exists the possibility of dye particles being adsorbed within crevices of the clay particles which, being relatively opaque, would thus effectively cover them from view.

The investigation of the color of the fibers and clays indicated that, in the case of Type 3 dyeing, very little dye was removed from the clay by the fibers. This effect was greater with the clay with the lower adsorbing power and produced a sheet of greater depth in color.

In the experiments on effect of varying the amount of clay it was found that, in the case of Clay A, the *SX* values at the same clay content were higher for Type 3 dyeing than for Type 2. This indicates that the fillers in the sheet exist in two different forms. Since Type 3 dyeings give higher *SX* values, this procedure should give a paper with a higher reflectance and less color, which is in line with the results obtained. These results indicate that color differences are influenced by the degree of association of the clay and dyes and the scattering power of these combinations in the final sheet.

Experiments have proved that the order of addition of the various ingredients is an important factor in the final color of the sheet. If the dye and fibers are mixed thoroughly, and the clay, size, and alum are then added, a greater depth of color is obtained in the dyed sheet than with other methods of addition.

The order of addition of the size and alum was also important. Definite color variations existed, depending on whether the size or the alum was first added to the clay-fiber-dye slurry. If the dye were added to the clay-fiber slurry in the presence of size, a deeper dyeing resulted than if the dye were added in the presence of the alum. In each case, the precipitation of the size occurred just prior to making the sheet. Therefore, it seems that, especially with basic and direct dyes, the dyeing is more effective in a less acid solution.

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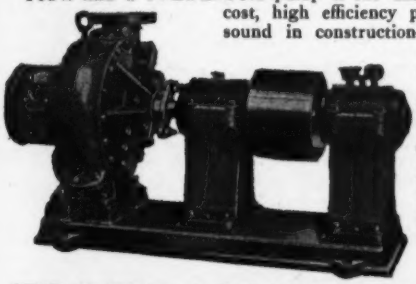

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New York Paper and Pulp Market Review

Paper Market Strong Under Heavy Rising Demand For All Grades —Wood Pulp Supply Situation Expected To Become More Acute— Waste Paper Demand Very Active—Rag Markets Active Under Strong Demand.

Office of the PAPER TRADE JOURNAL,
Wednesday, September 1, 1943.

The wholesale paper market continues to reflect increasing tightness in the supply situation. Most current reports received from manufacturers' representatives, jobbers, and general paper merchants also reflect concern over the prospect of a more sharply limited trade supply and increasing governmental control of the paper industry in the future. Orders and inquiries for all kinds of paper are steadily rising above supply.

New schedules of the WPB covering standards and simplifications for commercial envelopes, stationery, etc., towels and napkins, were issued August 30. Commercial envelopes must not be made from paper exceeding 28 pounds in weight after September 30.

The index of general business activity for the week ended August 21 declined to 141.6, from 143.2 for the previous week, compared with 131.6 for the corresponding week last year. The index of paper board production was 174.6, compared with 153.2 for the previous week, and with 117.4 for the corresponding week last year.

Paper production for the week ended August 21 was estimated at 91.1%, compared with 81.2% for 1942, with 102.8% for 1941, with 84.7% for 1940, and with 83.3% for the corresponding week for 1939.

Paper board production for the week ended August 21 was 95.0%, compared with 74.0% for 1942, with 94.0% for 1941, with 84.7% for 1940, and with 72.0 for the corresponding week for 1939.

Wood Pulp

The threat of a serious shortage of paper based on an inadequate supply of pulpwood, has at last stirred governmental agencies and efforts are now being made to increase the supply of pulpwood and lumber from farm woodlots. Although a somewhat late start has been made, an intensive drive may be expected to result in a good supply of pulpwood from farms this winter, despite the somewhat acute short supply of labor occurring during the crop harvesting periods.

Rags

The new and old rag markets are active under a strong demand for all grades. Mill buying of colored cuttings is reported active. Demand for new white shirts and the unbleached grade is also reported in heavier volume at this date.

Old Rope and Bagging

Mill demand for old No. 1 Manila rope continues to exceed limited supplies and all hemp fibers continue in a strong market position.

Trading in scrap bagging continues on a limited scale. This market is reported slow. The drastic restrictions on the use and sale of jute by the WPB amendment Order-M-70, has, it is the opinion expressed in several quarters, had an adverse effect upon sales of bagging. Prices continue nominal.

Old Waste Paper

The old waste paper market is strong, as mill demand is reported still rising above supplies. Several mills have just issued renewed appeals for increased collections of waste paper.

The growing tight supply situation in wood pulp, with tighter government regulations, indicates a tight situation is likely to develop in paper stock relatively soon, unless more adequate supplies are available. Manpower shortage in collecting paper stock continues to be reported as serious, which basic situation is reported in all industries and trades.

Twine

Strong demand for twine continues to be reported in most quarters of this market. The lack of Manila for civilian use is a difficult problem to meet, and the extensive substitution of sisal is not very satisfactory, especially for cordage. Prices are firmly maintained.

OPA Appoints Advisory Committee

WASHINGTON, D. C., August 30, 1943 — Twelve representative members of the paper industry have been appointed to a sulphite and bleached kraft papers industry advisory committee, the Office of Price Administration announced today.

These business men, who represent both large and small companies, will advise OPA in connection with price ceilings on sulphite and bleached kraft papers.

The initial meeting of the committee was held in New York at the Hotel Waldorf Astoria, August 18. William B. McGoldrick, chief, industrial papers unit, in the national office of OPA, and Henry J. Stein, of the legal staff in OPA's Paper and Paper Products Branch, attended the meeting.

The committee follows: F. W. Cole, sales manager, Fraser Industries, Inc.; D. F. McCall, vice-president, Racquette River Paper Company; G. Stuhr, sales manager, Kraft and Specialty Paper Division, International Paper Company; H. O. Nichols, manager New York office, Crown Zellerbach Corp., and R. I. Worrell, president, Mead Sales Company, all of New York City.

A. Southon, sales manager, Kalamazoo Vegetable Parchment Company, Kalamazoo, Mich. H. R. Telfer, president, Detroit Sulphite Pulp and Paper Company, Detroit; E. W. Kiefer, president, Port Huron Sulphite and Paper Company, Port Huron, Mich.; J. L. Madden, vice-president, Hollingsworth and Whitney Co., Boston; John H. Smith, president, Hawley Pulp and Paper Company, Portland, Ore.; I. N. Frisby, sales manager, Chicago division, Nekoosa Edwards Paper Company, and F. P. Pandow, sales manager, Consolidated Water Power and Paper Company, both of Chicago.

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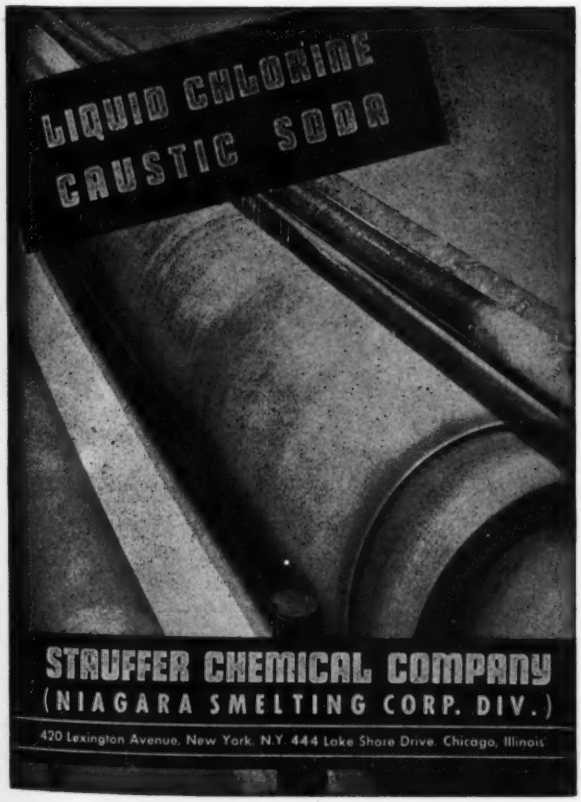

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
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BLANC FIXE—The market for blanc fixe continues firm and prices are unchanged. The current quotation is $40 per ton in barrels, at works; the powder is offered at $60 per ton, f.o.b., works.

BLEACHING POWDER—Quotations on bleaching powder are reported as firm and current demand is active. Bleaching powder is currenly quoted at $2.50 per 100 pounds, in drums, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b., shipping point.

CAUSTIC SODA—Quotations on caustic soda are reported unchanged. Supply for the current week is reported tight. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Prices on china clay are firm and continue unchanged. Demand reported fair for the current week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Prices on chlorine unchanged. Government demand for war use continues heavy. Prices firm. Supply easy. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—Quotations on some grades of rosin are lower for the current week. "G" gum rosin is currently quoted at $3.95 per 100 pounds in barrels, Savannah. "FF" wood rosin is currently quoted at $3.85 per 100 pounds in barrels, New York. Seventy per cent gum rosin size is currently quoted at $4.14 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand reported light for the current week. Domestic salt cake is currently quoted at $15 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Supply tight. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are unchanged for the current week. Supply situation tight. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds. All prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Supply more limited for the current week. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at from $2.25 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices of sulphur are reported as firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b, mines. Spot supplies and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $16 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract	*$54.00	@	—
Sheets	62.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.60	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mla. Ll. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65@$13.50
No. 2 Glossy Coated	12.40 " 14.00
No. 3 Glossy Coated	11.60 " 13.25
No. 4 Glossy Coated	11.15 " 12.75
No. 1 Antique (watermarked)	10.25 " 11.75
No. 2 Offset	9.60 " 11.00
A Grade E. F.	9.35 " 10.75
A Grade S. & S. C.	9.60 " 11.00
B Grade E. F.	8.85 " 10.25
B Grade S. & S. C.	9.10 " 10.50
C Grade E. F.	8.55 " 9.75
C Grade S. & S. C.	8.80 " 10.00
D Grade E. F.	8.25 " 9.50
D Grade S. & S. C.	8.50 " 9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight, Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$76.00
Unbl. Softwood Sulphite	65.00@ 66.00
Bl. Hardwood Sulphite	73.50
Unbl. Hardwood Sulphite	63.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00 @ 82.00
N. Bleached Sulphate	84.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi-Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	66.00
Unbl. Soda	62.00
Groundwood	46.00

Transportation Allowances Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.

More than just a TRADE MARK

EXCELSIOR KNOX Woolen Co. Camden, Me. FELTS & JACKETS

BUT also a guarantee by men who for 78 years have prided themselves in making finer felts. TO YOU —this is the mark of dependability, longer felt life and greater saving.

KNOX WOOLEN CO.
CAMDEN, MAINE.

AMES Thickness Measure No. 25

This compactly designed instrument (the only one of its kind made) meets every demand for a neat pocket gauge to measure thicknesses with speed and accuracy.

$10.50
FULLY GUARANTEED

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WALTHAM, MASS.

SCREENS of Perforated Metal

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WOOD
METAL
RUBBER
PLASTIC

PATENTED "SHAF-TITE" CONSTRUCTION

RODNEY HUNT ROLLS
Mean
STRONGER LONGER LIFE
due to patented features
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PAPER CONVERTING MACHINES
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Paper Bag Machines, Aniline & Oil-Ink Presses, Waxing, Gluing, Varnishing, Laminating Machines.

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STEAM TURBINES
HELICAL GEARS
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AND COMPRESSORS

DE LAVAL STEAM TURBINE CO. TRENTON, N.J.

CENTRIFUGAL PUMPS
PROPELLER PUMPS
CLOGLESS PUMPS
MIXED-FLOW PUMPS
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DEINKING — DECOLORIZING
K-121-B and K-C-2
COOKING PROCESSES
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MISCO "C"
THE CORROSION RESISTANT ALLOY
CAST • ROLLED • FABRICATED
for all equipment exposed to corrosion by sulphite acids
MICHIGAN STEEL CASTING CO., DETROIT, MICH.

Appleton Felts MAKE GOOD PAPER
APPLETON WOOLEN MILLS
APPLETON, WISCONSIN

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.25	@	4.35
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	5.00
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.57½	"	—
Mixed Books	.85	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	.85	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	-	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07½	@	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¼
Black Silesias, soft	.03¾	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¾	"	.03½
Washable No. 1	.02	"	.02¼
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	.03¾	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¾
No. 2 Mixed	.02¼	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¾	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
White No. 2—Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed	1.00	"	1.50
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Hard White Shavings	2.87½	@	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.57½	"	—
Mixed Books	.85	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	3.75	@	4.00
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	*4.25	"	—
Mixed Rope	1.35	"	1.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.60	"	3.85
Wool Tares—			
Foreign	(nominal)		

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Jute Corrugated Cuttings	1.07½	"	—
Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.15	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	4.65	"	4.87½
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Bagging	1.35	"	—*

* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No 1.	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06¾	"	.06¾
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached Blue Cheviots	.06½	"	.06¾
	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¾	"	.03½
New Canvas	.06¼	"	.06¾
B. V. D. Cuttings	.06½	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—*
Miscellaneous	3.20	"	—*
White No. 2—			
Miscellaneous	2.65	"	—*
Twos and Blues, Repacked	2.20	"	—*
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—*
Miscellaneous	1.80	"	—*
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—*
No. 2	1.45	"	—*
No. 3	1.35	"	—*
No. 4	1.35	"	—*
No. 5, Quality A	1.35	"	—*
Quality B	1.20	"	—*
Quality C	.95	"	—*
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—